State Route 12 (SR-12)

Comprehensive

Transportation

Corridor Study

Rio Vista Bridge to SR-99

Final Report

Prepared for
Caltrans
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Prepared by
Kimley-Horn and Associates, Inc.
Cambridge Systematics, Inc.
Michael Brandman Associates

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1 INTRODUCTION

1.1 Study Purpose

The purpose of the SR 12 Corridor Study is to engage stakeholders to identify conceptual physical improvements and management practices necessary to appropriately serve existing and future travel demand. The study concludes by developing preferred conceptual alternatives for the corridor along with high-level sequencing of projects.

The California Department of Transportation (Caltrans) District 10 has selected Kimley-Horn and Associates, Inc. (Kimley-Horn) to develop this State Route 12 (SR 12) Corridor Study. Other team members include Cambridge Systematic, and Michael Brandman Associates.

Project partners with Caltrans District 10 include the following local and regional agencies:

- Caltrans District 3
- Caltrans District 4
- Caltrans District 6
- City of Isleton
- City of Lodi
- City of Rio Vista
- Federal Highway Administration
- San Joaquin Region Transit District
- Rio Vista Transit
- South County Transit
- Grapeline Transit Service
- Sacramento Area Council of Governments
- San Joaquin Council of Governments
- Solano Transportation Authority
- Sacramento County
- San Joaquin County
- U.S. Army Corps of Engineers
- U.S. Coast Guard
- California Fish and Game
- California Highway Patrol
- Department of Defense

1.2 State Route 12 Description

SR 12 is an important east-west conventional highway connecting Sonoma, Napa, Solano, Sacramento, San Joaquin, and Calaveras Counties, providing interregional movement of goods and people. In Sacramento and San Joaquin Counties, the majority of SR 12 traverses the Delta. SR 12 was chosen as a safety corridor by Caltrans and the SJCOG in 1998. The facility had been a double-fined highway for speed limit and other infractions, but this has since expired. Based on current traffic volumes, portions of SR 12 are currently operating at deficient levels of service (LOS) D and E during the morning and afternoon peak hours. The high traffic volume along SR 12 is generated by regional through trips, goods movement, intercity travel, commute traffic, agricultural truck trips, and recreational travel.

The study area is SR 12 between the Rio Vista Bridge in Rio Vista and State Route 99 (SR 99) in the City of Lodi, a total distance of approximately 24 miles. Table 1.1 presents the study limits.

Table 1.1: Project Study Limits

County	Post Mile	Description
Solano	26.23 – 26.40	Rio Vista Bridge
Sacramento	0.00 – 6.00	Rio Vista Bridge to Mokelumne River Bridge
San Joaquin	0.00 – 4.99	Mokelumne River Bridge to Potato Slough Bridge
San Joaquin	4.99 – 10.16	Potato Slough Bridge to I-5
San Joaquin	10.16 – 18.01	I-5 to SR-99

The segment of SR 12 between Rio Vista Bridge and I-5 is mainly a two-lane rural arterial with variable widths of shoulders. It passes through White Slough State Wildlife Area, Terminous Tract, Tower Park Marina, Bouldin Island, and other islands. This segment of SR 12 includes drawbridges over Rio Vista, Mokelumne River, and Potato Slough. The surrounding land is flat and mainly agricultural.

The segment of SR 12 east of I-5 is a two-lane arterial until the Lodi City Limit at Lower Sacramento Road. An at-grade crossing is at the Union Pacific railroad. The segment of SR 12 east of Lower Sacramento Road is a five-lane divided arterial (four lanes plus center left-turn lane) passing through downtown Lodi serving adjacent retail land use. This segment has signalized intersections and bicycle lanes, in addition to a grade-separated railroad crossing at the Southern Pacific railroad.

The economy of the study area has traditionally relied on agricultural production. San Joaquin County ranks seventh out of 58 counties in California in market value of agricultural products sold. The San Joaquin Valley, which includes San Joaquin County and seven other counties, produces 49% of California's agricultural products (United States Department of Agriculture, *2002 Census of Agriculture*, 2002).

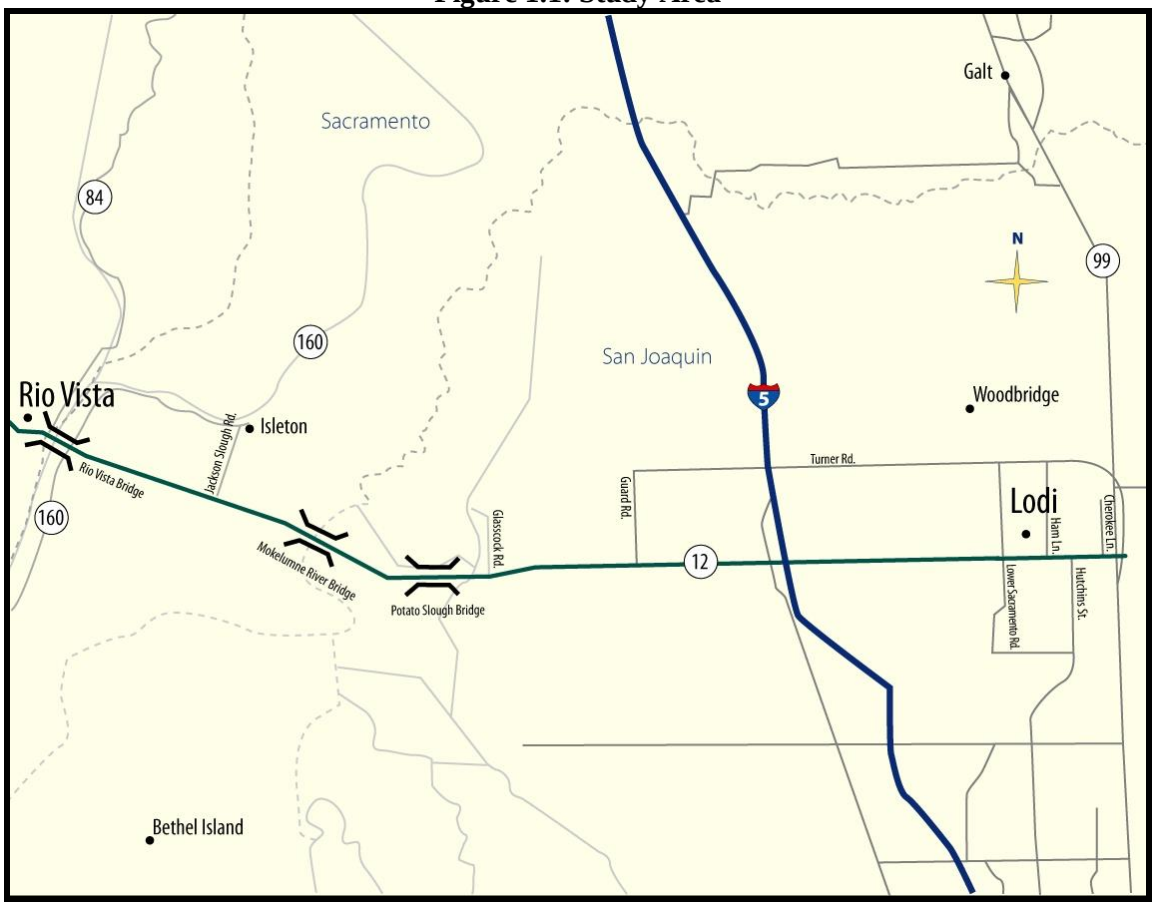
At the same time, the study area has been experiencing heavy urban development. The population of San Joaquin County has increased by 35% between 1990 and 2004 (from 481,000 persons to 650,000 persons). The population of Sacramento County has increased by 30% during the same period (from 1,041,000 persons to 1,352,000 persons). Much of this growth has been a by-product of the high costs of living or conducting business in the San Francisco Bay Area. This trend is likely to continue and pose planning challenges to the area.

As an interregional travel route, the operation of SR 12 is heavily influenced by growth in Lodi (and other Central Valley communities) and ever increasing inter-regional travel demand between the nine-county Bay Area and the Central Valley. SR 12 also serves as an inter-regional highway for heavy duty trucks and is a regional and inter-regional recreational route for weekend travelers. Growth in Lodi and the Bay Area has resulted in the growth of inter-regional traffic on SR 12, a pattern that will continue in the

foreseeable future. With few parallel routes in the area, SR 12 is an important inter-regional freeway.

Figure 1.1 shows the study area.

Figure 1.1: Study Area



2 EXISTING CONDITIONS

2.1 Existing Highway Operations

2.1.1 Review of Other Studies and Sources

Several transportation studies and data sources were reviewed and used to support SR 12 corridor evaluations. These included the following:

- *Caltrans SR 12 Corridor Safety Project Phase IV (2000).* Accident locations, traffic volumes, and other roadway characteristics were obtained and used in this analysis.

- *Caltrans Traffic and Vehicle Data Systems Unit Traffic Counts*. Average Annual Daily Traffic (AADT) counts were obtained from Caltrans for 1980, and 1994 through 2004. Traffic data considered all count locations on SR 12 between Rio Vista and Lodi. Heavy-truck counts were obtained from this same source for 1994 through 2003.

- *San Joaquin Council of Governments Route 12 in San Joaquin County Corridor Study (1997).* Travel patterns into and out of San Joaquin County, existing and future traffic volume projections for 1994 and 2020, SR 12 roadway characteristics, and alternative project improvement strategies were obtained from this source.

- *San Joaquin Council of Governments (SJCOG) Regional Travel Demand Model (1999).* The full model system dataset was provided by SJCOG. Information and data evaluated and used in the SR 12 Corridor Study included base transportation networks and volumes (1994), forecasted volumes for 2005 and 2030, traffic counts for locations along an east-west screenline of the corridor, socioeconomic data and growth projections for 1994, 2005, and 2020, and traffic growth rates between the Central Valley and the San Francisco Bay Area.

- *Napa/Solano Multi-Modal Travel Demand Model (2005).* The Solano Transportation Authority (STA) provided the model dataset for the Napa/Solano Multi-Modal Travel Demand Model. Network, volume, and external travel patterns in the SR 12 corridor were reviewed and used.

- *Solano Transportation Authority – State Route 12 Major Investment and Corridor Study (2001).* Traffic volumes, safety data, and information on the prioritization of improvement projects for SR 12 in Solano County were used to support the SR 12 Corridor Study.

- Solano *Transportation Authority – Prioritization of Highway 12 Improvements (2005).* This presentation document outlined near-term, mid-term and long-term improvement projects for SR 12 in Solano County.

- *Caltrans Project Study Report on Route 12 between Mokelumne River Bridge and I-5 (1997).* The geometric design and associated cost of several improvement alternatives were outlined in this report and used to support the SR 12 Corridor Study.

- *Caltrans Sacramento River Crossing at Rio Vista Project Feasibility Report (1994).* Existing and forecasted traffic volumes and project improvement strategies for the Rio Vista area were obtained.

- *City of Stockton General Plan Circulation Element (2005).* This document outlined existing and future transportation conditions for Stockton, the largest city in San Joaquin County.

- *City of Lodi General Plan (1991).* Traffic volumes and future traffic projections were presented in this report.

- *San Joaquin County General Plan 2010 (1992).* A transportation vision for the county was presented in this report, and was also complemented by traffic, land use, demographic, and socioeconomic data.

- *San Joaquin Council of Governments Regional Transportation Plan Project List (2004).* Details and cost estimates of future transportation projects in the vicinity of and along SR 12 were obtained.

- *Metropolitan Transportation Commission Regional Transportation Plan Project List (2004).* Details and cost estimates of future transportation projects in the vicinity of SR 12 were obtained.

- *Sacramento Area Council of Governments Regional Transportation Plan Project List (2004).* Details and cost estimates of future transportation projects in the vicinity of SR 12 were obtained.

- *Rio Vista General Plan Circulation Element (2001).* Community vision for transportation in the Rio Vista area was documented in this source.

- *Rio Vista High Bridge Study (1993).* This source provided traffic volumes for the Rio Vista area.

- *The CALFED Bay-Delta Program Record of Decision (2000).* This document outlined a broad framework of actions to restore ecological health and improve water management for beneficial uses of the San Francisco Bay/Sacramento – San

Joaquin Delta system. Five surface storage proposals were evaluated, including the In-Delta Storage Project. The findings of this report will affect right-of-way decisions made for projects proposed as part of the SR 12 Corridor Study.

The following studies were reviewed and used to support both existing and future analysis of transit.

- *I-80/I-680/I-780 Transit Corridor Study (2004).* Information about transit funding in Rio Vista was obtained from this report prepared by the STA for use in the SR 12 Corridor Study. It was determined that Rio Vista uses 41% of its Transportation Development Act (TDA) allocation on transit.

- *Rio Vista Transit Study (2005).* Existing and potential new transit services, route coverage, and travel demand data were obtained from this study. For example, Rio Vista is the fastest growing city in Solano County, which in turn is among the fastest growing counties in the San Francisco Bay Area. This creates additional demand for new transit service. Rio Vista Transit provides demand responsive service within Rio Vista and provides intercity service to Isleton, Lodi, Stockton, Fairfield, Vacaville, Antioch, and Walnut Grove. The most common destinations of originating Rio Vista transit users included Rio Vista (44%), Lodi (30%), and Fairfield (16%). In January 2005, the City of Rio Vista began a six-month intercity pilot transit service called the Delta Breeze.

- *Solano Comprehensive Transportation Plan (CTP) (2002).* This plan, completed by the STA, identified transit needs for Rio Vista such as fixed intercity routes to BART and rail, and a SR 12/Church park-and-ride lot. A number of intercity bus transit routes also were recommended for implementation including Route 12C along the SR 12 corridor linking Rio Vista and Lodi.

- *Highway 12 Major Investment Study (2001).* Information from this STA study was used to support the SR 12 Corridor Study. Three alternatives were recommended for the near-term: Transportation Demand Management (TDM), Safety Improvements, and Traffic Operations. Four were recommended for the long-term: TDM, Safety Improvements, Traffic Operations, and Main-Line Widening. TDM alternatives included a Carpooling Program with Park-and-Ride Lot Construction, including one park-and-ride lot in Rio Vista. Also included was a Local Shuttle Program, which would give the retirement communities in the east end of the corridor (e.g., Trilogy) access to the commercial and medical facilities in cities like Rio Vista. The service would coordinate with existing transit service in the Counties of San Joaquin and Sacramento.

- *The State Route 12 Transit Corridor Study – Existing Conditions (2005).* Travel patterns data from this study completed by the STA were reviewed and used to support this study. The highest demand for transit service along SR 12 is expected to be from Fairfield/Suisun to Napa. High demand is also expected for trips from

Napa to Fairfield/Suisun, and for trips originating from Rio Vista. Therefore, the highest priorities are transit connections between Fairfield/Suisun and Napa, and between Fairfield/Suisun and Rio Vista. The next priority would be to increase frequency of transit service and provide transit connections to Lodi and Antioch.

2.1.2 Demand Analysis

Caltrans AADT count data were used to prepare base year (2005) traffic movements by segment for the SR 12 corridor, as they represent the most recent counts in the corridor. The data sources listed in Section 2.1.1 were used to determine daily and peak period (morning and afternoon) traffic for 2005 as well as expected traffic growth in the corridor to 2030.

Existing and future traffic volumes for the corridor were determined using the following approach:

Step 1 – Prepared 2005 Traffic Estimates. Data sources were reviewed to determine appropriate base year (2005) traffic volumes for the corridor. The Caltrans AADT counts were found to be the most current, reliable, and representative traffic data for SR 12. They were used as the basis for developing 2005 daily, morning, and afternoon peak-hour travel volumes for the corridor.

Step 2 – Calculated 2010, 2015, and 2030 Growth Rates. Future growth rates were developed from multiple sources to predict traffic volumes in the corridor for expected 2010, 2015, and 2030 conditions. Given the different urban and rural travel patterns along the corridor, a consistent growth rate was not applied for the entire corridor. The corridor was divided into different sectors depending on factors such as travel patterns and land use, and growth rates were calculated for each sector.

Step 3 – Calculated Initial Daily 2010, 2015, and 2030 Traffic Forecasts. Growth rates were applied to the 2005 traffic volumes to calculate future traffic forecasts for 2010, 2015, and 2030, representing near-term, mid-term, and long-term forecast years respectively.

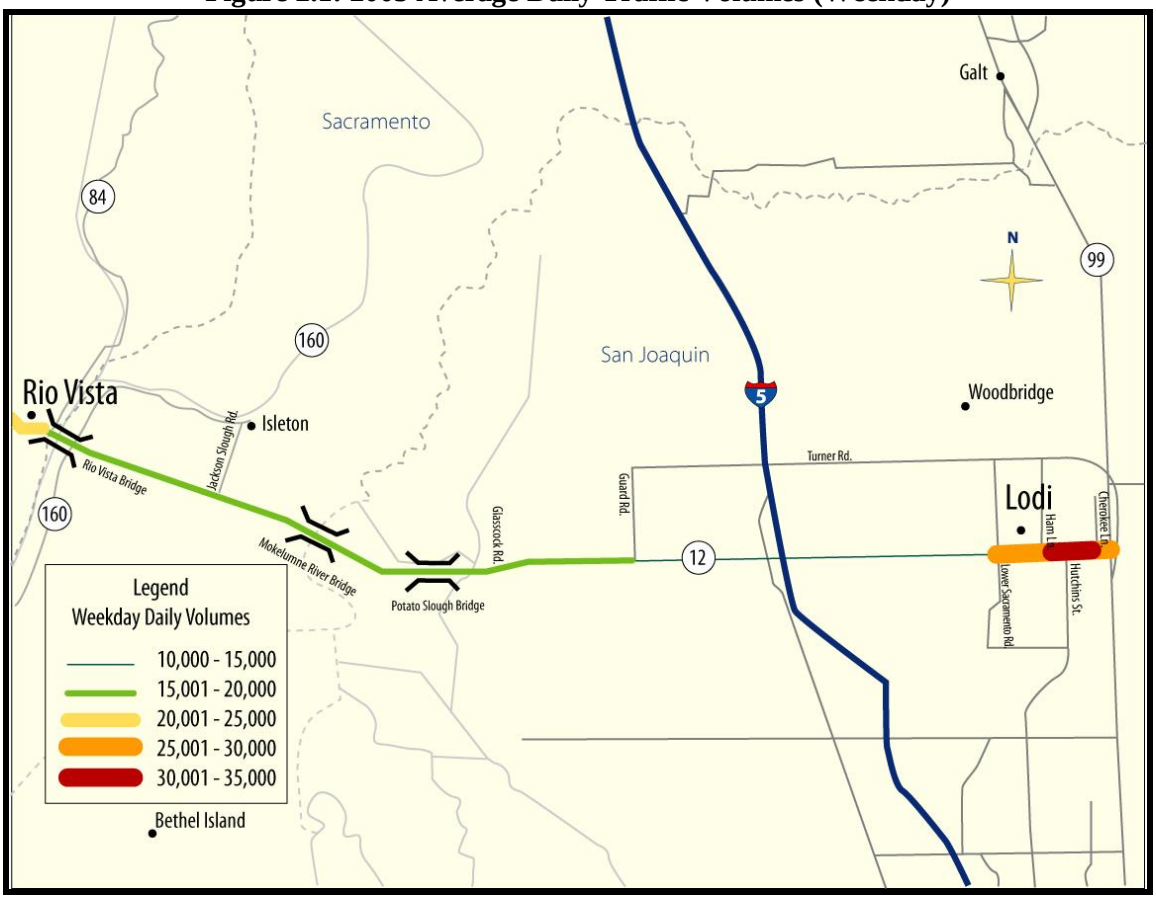
Step 4 – Finalized Daily 2010, 2015, and 2030 Traffic Forecasts. Adjustments were made to the forecasts to ensure consistency in traffic volumes across continuous segments. This step essentially balanced the forecasts and eliminated unrealistic fluctuations in traffic volumes from one segment to the next.

Step 5 – Calculated, Balanced, and Finalized Peak Hour 2010, 2015, and 2030 Traffic Volumes. Peak hour traffic counts from Caltrans in combination with peak-hour travel patterns from the SJCOG Travel Model were used to generate morning and afternoon peak hour traffic volumes and percentages for each segment in the corridor. Percentages were applied to daily traffic to develop trends based on historical percentages. These trends were used to calculate peak hour traffic volumes for 2010, 2015, and 2030.

2.1.3 Existing Traffic Volumes

Existing volume west of I-5 is approximately 16,000 vehicles per day (vpd), while within the City of Lodi, daily volumes are approximately 27,000 vpd. The busiest segments of SR 12 are located in Lodi, as shown in Figure 2.1. SR 12 (Kettleman Road in Lodi) serves as a major east-west thoroughfare for the residents of Lodi. Traffic volumes remain constant between Rio Vista and I-5 because of the limited number of intersections with SR 12 in this area.

Figure 2.1: 2005 Average Daily Traffic Volumes (Weekday)



Afternoon peak hour volume patterns in the corridor show similar characteristics as daily volumes, as shown in Figure 2.2. SR 12 corridor evaluations presented later in this report (Sections 3.0 and 4.0) were based on daily and afternoon peak hour volumes, as afternoon volumes are greater than morning volumes.

Figure 2.2: 2005 Weekday Average Afternoon Peak Hour Volumes

SR 12 is one of a limited number of east/west roadways between Sacramento and Stockton that connects the Central Valley with the Bay Area. This roadway serves a broad mix of recreational, inter-regional, commuter, agricultural, and truck traffic and movements. During the recreational season, long queues may develop along the corridor and in particular, at the bridge locations, which can be attributed to a combination of heavy traffic volumes, raising and lowering of the bridges along SR 12, and slow moving recreational vehicles and heavy trucks. As a primary east/west freeway and a designated truck route, SR 12 is heavily used by inter-regional traffic and by trucks. Recreational traffic, which includes recreational vehicles and vehicles with boats in tow, is slow-moving, reducing the level of service of the facility. Slow agricultural vehicles, including tractors, also use and cross the highway at certain locations, which creates a safety hazard for faster-moving traffic. This mixture of traffic on SR 12, while reducing safety, also reduces the level of service of the facility. Improvements need to be devised to alleviate these operational and safety problems on SR 12 as more detailed transportation analysis are performed.

2.1.4 Level of Service

Level of service (LOS) is used to measure the operational conditions within a traffic stream and the motorist's perception of these conditions. LOS is a quantitative stratification of the quality of service provided by the transportation facility. Caltrans distinguishes LOS on conventional highways by six letter grades, A through F, with A being the best (i.e., free-flow speeds with minimal delays) and F being the worst (severe congestion and long delays). Table 2.1 shows the definitions of each level of service grade as defined by the *2000 Highway Capacity Manual (HCM)*.

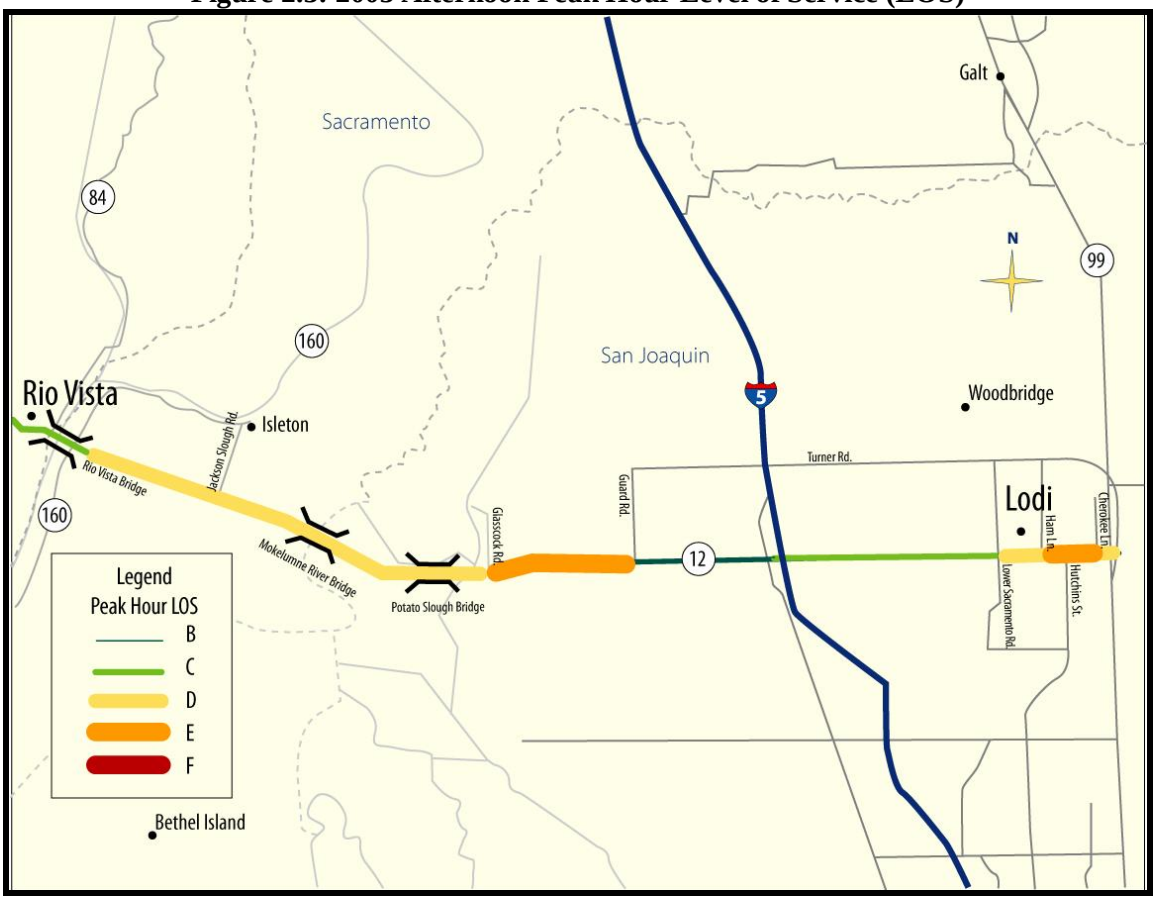
Table 2.1: Level of Service Definitions

Level of Service (LOS)	Operating Speed	Operational Characteristics
A	55+ mph	No congestion or delay. Free to stable flow, light to moderate volumes.
B	50 mph	No congestion or delay. Free to stable flow, light to moderate volumes.
C	45 mph	None to minimal delays. Stable flow, moderate volumes, freedom to maneuver noticeably restricted.
D	40 mph	Minimal to substantial delays. Approaches unstable flow, heavy volumes, very limited freedom to maneuver.
E	35 mph	Significant delays. Extremely unstable flow, maneuverability and psychological comfort extremely poor.
F	Less than 35 mph	Considerable delays. Forced or breakdown of traffic flow.

Source: *2000 Highway Capacity Manual.*

Figure 2.3 presents the existing afternoon peak hour LOS on the study corridor based on Caltrans roadway definitions.

Figure 2.3: 2005 Afternoon Peak Hour Level of Service (LOS)



The SR12 corridor operates between LOS B and E during the afternoon peak hour with a number of segments operating close to capacity. Roadway capacity is constrained with only one lane in each direction between Rio Vista and Guard Road. Between Guard Road and Thornton Road, two lanes in each direction are provided. This accounts for the improved roadway operations on this segment. SR 12 operates at LOS E in specific segments in downtown Lodi and at other locations along the corridor.

Table 2.2 shows the 2005 afternoon peak level of service for each segment of SR 12.

Table 2.2: 2005 Afternoon Peak Hour Level of Service by SR 12 Segment

SR 12 Segment	2005
Between Rte. 84 and Rte. 160 (Rio Vista Bridge)	C
East of Rte. 160	D
West of Terminous Rd.	D
East of Terminous Rd.	D
West of Tower Parkway	D
East of Tower Parkway	E
West of Guard Rd.	E
West of I-5 to Thornton Rd.	B
East of Thornton Rd.	C
West of Lower Sacramento Rd.	C
East of Lower Sacramento Rd.	D
West of South Ham Lane	D
East of South Ham Lane	D
West of South Hutchins Street	E
East of South Hutchins Street	E
West of Central Ave.	D
East of Central Ave.	D
West of Cherokee Lane	D
Between Cherokee Lane and South Jct. Rte. 99	D

2.1.5 Truck Traffic

SR 12 is the main east-west corridor for truck movement in the Delta. The entire length of SR 12 is part of the federal Service Transportation Assistance Act (STAA) highway network as identified by Caltrans. Highways that belong to the STAA network can accommodate trucks that are longer than the California legal standard. The nearest east-west corridor in the Delta is SR 4, which is not entirely a STAA highway, and therefore cannot accommodate trucks longer than the California Legal standard.

SR 12 is also a major Department of Defense (DoD) Truck Route. It is a significant corridor for shipments into and out of Travis Air Force Base (AFB), a vital DoD link to the Pacific. It is used daily for high priority shipments from the Defense Logistics Agency Distribution Center in Tracy, CA to Travis AFB, CA.

Figure 2.4 presents the daily heavy truck traffic percentages on SR 12.

Figure 2.4: 2005 Daily Truck Traffic Percentages of Total Traffic on SR 12

As shown in Figure 2.4, trucks constitute approximately 9 to 15 percent of total vehicles in the SR 12 corridor, with the higher percentages west of I-5 the result of interregional truck movements between the San Francisco Bay Area and the San Joaquin Valley. The shift in truck volume at Glasscock Road can be attributed to the development at Tower Park. Approximately 10 percent of traffic using SR 12 in Lodi are trucks. This is due to several factors, including the presence of warehousing, other truck related facilities, and deliveries to Lodi businesses. Other large and slower vehicles using and crossing SR 12 include RVs and agricultural equipment.

2.1.6 Travel Speed Limits

As shown in Figure 2.5, the speed limit along SR12 in the study area is 55 mph, with the exception of downtown Lodi, where posted speed limits range from 35 mph to 40 mph.

Figure 2.5: Posted Speed Limits on SR 12

2.1.7 Bridges

The Delta has many bridges that cross rivers and sloughs. The SR 12 corridor includes drawbridges over Rio Vista, Mokelumne River, and Potato Slough, all of which open to accommodate water traffic. Both the Mokelumne River Bridge and Rio Vista Bridge cross navigable waters, with the U.S. Coast Guard (USCG) as the controlling jurisdiction. The USCG has authority over construction activities, signals at bridges, and regulations that govern drawbridge operations. This authority is administered by the Eleventh Coast Guard District Bridge Section. Table 2.3 presents a description of the three drawbridges impacting the SR 12 corridor in the study area.

Table 2.3: SR 12 Corridor Draw Bridges

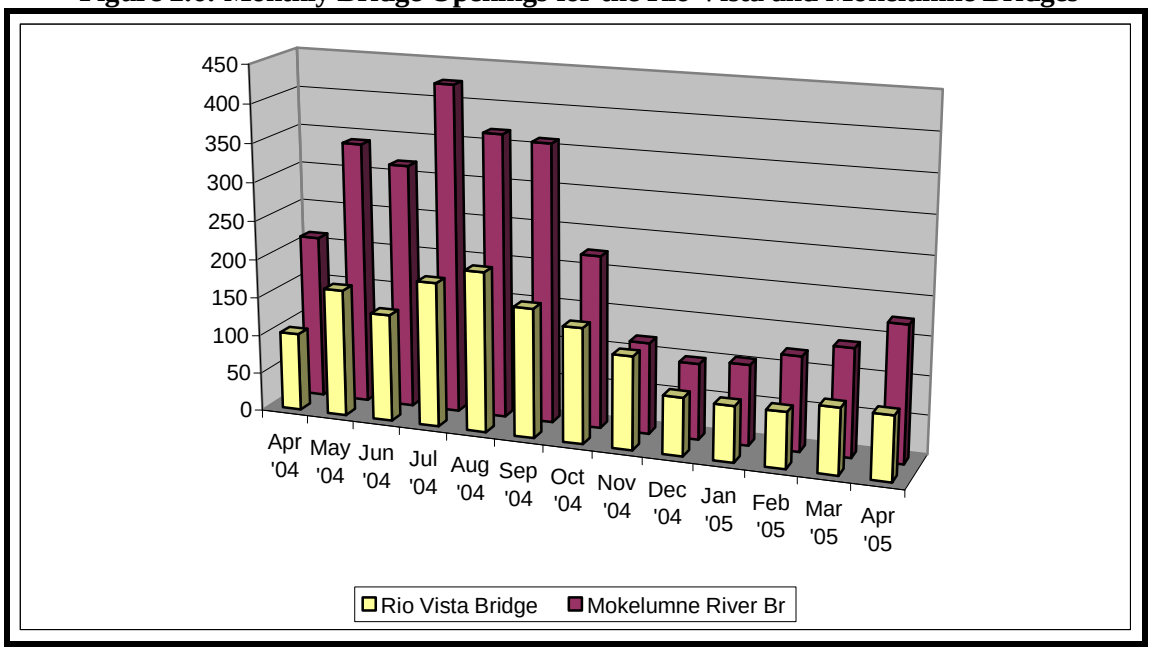
Bridge	Year Built	Type	Typical High-Tide Clearance	Operation Schedule
Rio Vista	1963	Lift Bridge (Counterweights)	18’	24 hours/7 days
Mokelumne River	1942	Swing Drawbridge (Pivot)	8’	May-Oct 6am-10pm Nov-Apr 9am-5pm 4 hours advance notice required
Potato Slough	1991	Swing Drawbridge (Pivot)	35’ (Unimpaired)	On-call only (Opened 6 times in 2004) 4 hours advance notice required

Source: California Delta Chambers & Visitors Bureau.

Localized level of service and queuing analyses were not performed separately for each bridge. Level of service analysis was conducted on roadway segments including those with bridges as part of a larger segment. The level of service analysis conducted for this study focused on average weekday corridor impacts and specific bottlenecks (including bridge locations) in segments along the corridor. Issues related to weekend traffic, summer impacts, while important to the overall operations of the Corridor, will be evaluated later during the detailed operations analysis for this Corridor. However, the KHA team does understand the delay and queuing impacts of the Bridges. Delays and traffic backups are more frequent during the summer months when greater recreational traffic result in more bridge openings. For example, the average number bridge openings per day are relatively low (two per day during the winter months and six per day in the summer for the Rio Vista Bridge, three per day during the winter and twelve per day during the summer for the Mokelumne bridge, and the Potato Slough bridge is opened less than ten times in a given year) and therefore were not part of the average weekday analysis performed for the Corridor.

Figure 2.6 shows the number of monthly openings from April 2004 through April 2005 for the Rio Vista and Mokelumne River Bridges.

Figure 2.6: Monthly Bridge Openings for the Rio Vista and Mokelumne Bridges



Source: California Delta Chambers & Visitors Bureau.

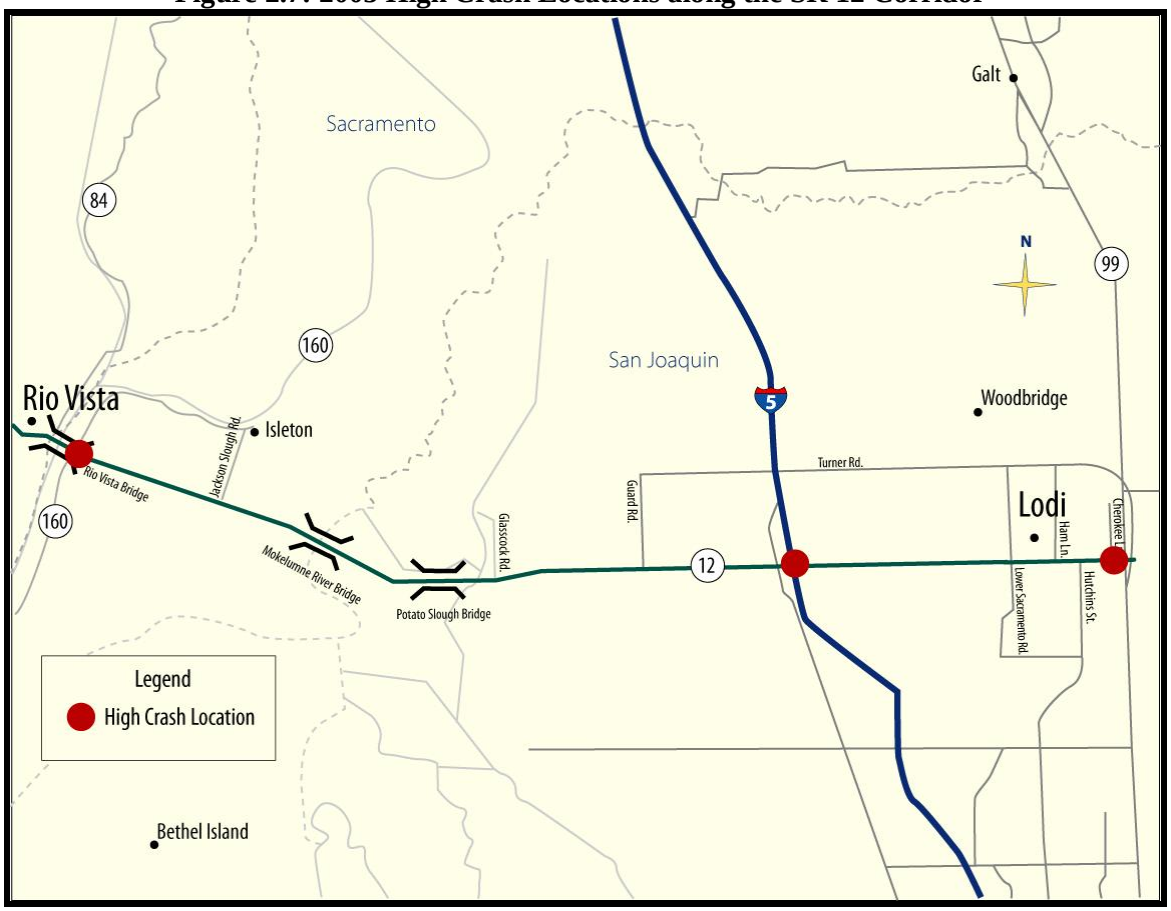
2.1.8 Bottlenecks and Queues

Long vehicle queues form when drawbridges open along the study corridor. With no alternative routes to bypass bridge openings, drivers must wait until bridge operations are completed to continue along SR 12. Limited right-of-way on the corridor near the bridges also constrains vehicle from diverting around accidents until they are fully cleared. Few available parallel east-west routes between the Delta and the San Joaquin Valley also potentially force drivers to make circuitous detours around any closure of SR 12.

2.1.9 Accident History and Safety

SR 12 was chosen as a safety corridor by Caltrans and the SJCOG in 1998. The facility had been a double-fined highway for speed limit and other infractions, but this has since expired. The recommendations of the SR 12 Corridor Safety Project Phase IV have already been successfully implemented by Caltrans including primary improvements related to roadway striping, signage, and enforcement. As shown in Figure 2.7, high crash locations are located at or near major roadways intersecting with SR 12, including SR 99, I-5, SR 160, and SR 84. Accidents primarily consistent of bodily injury and property damage.

Figure 2.7: 2005 High Crash Locations along the SR 12 Corridor



Source: Caltrans, 2005.

2.2 Existing Transit Operations

2.2.1 Transit Providers

2.2.1.1 Grapeline

Grapeline (City of Lodi Transit Division) operates seven fixed local routes in Lodi, including four routes along Kettleman Lane (SR-12) between Lower Sacramento Road and Cherokee Lane. Major transfer locations include the Wal-Mart/Target stop near SR-12, and the Lodi Transportation Station, which provides links to Amtrak, Sacramento RT, Calaveras Transit, South County Transit and Greyhound.

Weekday service is offered 6:00 AM – 8:00 PM; weekend service is offered 7:45 AM – 5:30 PM. Grapeline increased its fares in January 2005. The base fare is now $1.00 for the general public. Grapeline offers dial-a-ride service within Lodi for a general-public fare of $5.00.

2.2.1.2 Rio Vista Transit

Rio Vista Transit provides dial-a-ride service to the general public within Rio Vista and to nearby cities, such as Vacaville, Fairfield, Antioch, Isleton, Walnut Grove and Lodi. Service is provided Monday through Friday, 8:00 AM – 5:00 PM. The fares range from $1.25 for locations within Rio Vista to $7 for locations outside of Rio Vista. Most users of Rio Vista Transit are considered transportation disadvantaged because there is limited or no transit service available to them.

In January 2005, the City of Rio Vista began a six-month intercity pilot transit service called the Delta Breeze. It provides door-to-door service within Rio Vista and to Isleton, Fairfield, and Antioch. Service is provided Monday through Friday, 7:00 AM – 5:00 PM.

2.2.1.3 San Joaquin Regional Transit District (SJRTD)

The SJRTD, the Regional Transit Provider for San Joaquin County, provides public transit services in the Stockton Metropolitan Area, as well as intercity, interregional, and rural transit services countywide.

Routes 23 and 24 operate interregional bus service between the Lodi Transportation Center and the City of Stockton. Service is offered weekdays 5:30 AM – 10:30 PM. The base adult fare is $1.25.

2.2.1.4 South County Transit (SCT)

SCT is based in Galt and operates in the southern part of Sacramento County. It has recently expanded its Delta Route to provide direct service to the communities of Isleton, Ryde, Walnut Grove, and Locke. Major stops along this route in Lodi include the Lodi Wal-Mart, Lodi Memorial Hospital and Lodi Transit Center. This route also provides

direct service to Galt with connecting service via Hwy 99 to Elk Grove and Sacramento. The Delta Route runs four times a day, Monday through Friday, 6:00 AM – 7:00 PM.

2.2.2 Existing Transit Ridership

Table 2.4 presents a summary of available operating statistics for transit services in the study area.

Table 2.4: Transit Operating Statistics

Measure	Grapeline Bus	Grapeline Dial-a-Ride	SJRTD Bus [1]	SJRTD Dial-a-Ride [1]
Vehicles	9	16	112	68
Annual Revenue Vehicle Miles	286,800	259,100	3,759,260	911,300
Annual Revenue Vehicle Hours	23,500	26,200	231,280	56,130
Annual Passenger Trips	433,300	87,600	4,452,800	152,090
Annual Passenger Miles	1,408,200	218,900	33,302,500	1,547,030

Note: [1] Statistics for San Joaquin County.
Source: Transit Agency Websites.

2.2.3 Park and Ride Lots

An existing Park and Ride lot is located on SR 12, east of I-5 near N. Thornton Road. Its capacity is less than 100 vehicles.

2.3 Population and Employment Projections

Population in San Joaquin County is projected to exceed one million by 2030. The county will maintain fast population growth over the next 25 years, with an annualized growth rate of 2.3%. Most growth in the county is expected to occur in urban communities, including Lodi. The increase in population is anticipated to be accompanied by increases in employment as jobs follow the migration of population, as shown in Table 2.5. However, employment levels are not expected to match needs in the area; thus, the large number of commuters through the study area is expected to remain. Agriculture has historically been the core of the county's economy; however, employment in this sector will decline and be surpassed by the service industry.

Table 2.5: Population and Employment Statistics

Year	Population		Number of Jobs	
	Lodi	San Joaquin County	Lodi	San Joaquin County
2000	56,999	563,598	21,450	195,710
2005	60,913	630,613	23,438	207,397
2010	65,028	708,364	25,466	220,000
2015	69,055	792,998	27,457	234,343
2020	73,130	888,536	29,449	250,624
2025	77,253	995,132	31,597	270,406
2030	81,717	1,117,006	33,686	289,461

Source: SJCOG, 2003.

2.4 Major Trip Generators

The SR 12 study corridor handles interregional, regional, and local traffic. Almost all traffic on SR 12 in the Delta is interregional, including through movements for cars and trucks to and from the Central Valley to the Bay Area. Other interregional trips are made by commuters and long-haul trucks traveling between the San Francisco Bay Area and the San Joaquin Valley.

The major trip generating cities in the study area include Lodi, Rio Vista, and a few additional smaller communities. Within Lodi, a mixture of interregional, regional, and local traffic uses SR 12. A number of retail establishments that serve the local population are located adjacent to the highway in Lodi. SR 12 also is the major thoroughfare that connects Lodi to the west; therefore, the majority of trips between Lodi and points west use SR 12. Travis Air Force Base in Solano County also is a major generator of truck trips on SR 12 as this roadway serves as a major supply route for the facility.

Table 2.6 presents the major employers near the SR 12 study corridor.

Table 2.6: Major Employers Near the SR 12 Study Corridor

Company Name	City	Number of Employees
California Medical Facility	Vacaville	1,200
California State Prison – Solano	Vacaville	1,200
Albertsons Distribution Center	Vacaville	700
Alza Corporation	Vacaville	700
Kaiser Permanente Medical Center	Vallejo	2,685
Kaiser Permanente Call Center	Vallejo	830
Six Flags Marine World	Vallejo	1,660
Fairfield-Suisun Unified School District	Fairfield	3,500
County of Solano	Fairfield	3,100
Solano County Government Center, Courts, and Health and Social Services	Fairfield	1,900
North Bay Medical Center	Fairfield	1,300
Travis Air Force Base (TAFB)	Travis AFB	15,000
TAFB - David Grant Medical Center	Travis AFB	1,500
River Delta Unified School District	Rio Vista	270
Lodi Unified School District	Lodi	2,247
Blue Shield of California	Lodi	725
Lodi Memorial Hospital	Lodi	650
General Mills	Lodi	575
Pacific Coast Producers	Lodi	530
City of Lodi	Lodi	387
Port of Stockton	Stockton	4,000+
County of San Joaquin	Stockton	1,000+
St. Joseph's Health Care	Stockton	2,800
Pacific Gas & Electric	Stockton	1,100
Dameron Hospital	Stockton	1,096
Golden 1 Credit Union	Stockton	1,093
Washington Mutual	Stockton	1,000

Source: Urbitran Associates, "State Route 12 Corridor Study: Final Draft Plan", October 2005
Wilbur Smith Associates, "I-80/I-680/I-780 Transit Corridor Study", July 2004.
State of California, Employment Development Department, 2006.

2.5 Environmental Documentation

A Program Environmental Impact Report (EIR) and an Environmental Impact Statement (EIS) are the probable environmental documents that will be necessary for this study. This level of documentation would be required due to the likely findings of unavoidable, significant cumulative impacts associated with this study. The study schedule and design will be most affected by issues related to biological resources, water quality concerns, floodplain encroachment, and socioeconomic impacts. Examples include acquisition of right-of-way, project construction, and changes in existing traffic patterns from modifications in street access to SR 12.

Caltrans would be the lead agency responsible for compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). Federal agencies likely to be involved in the improvement alternatives include the United States Coast Guard, and Federal Highway Administration (FHWA), and the Army Corps of Engineers (ACOE). Other agencies with varying responsibilities for compliance with NEPA/CEQA include Caltrans, City of Rio Vista, City of Lodi, San Joaquin County, Solano County, Sacramento County, San Joaquin Valley Air Pollution Control District, California Air Resources Board, State Lands Commission, and the Environmental Protection Agency.

Table 2.7 presents applicable laws and documentation required for foreseen environmental issues within the SR 12 corridor.

Table 2.7: Applicable Environmental Laws and Documentation

Environmental Issue	Executive Orders/Guide- lines/ Laws Applicable	Documentation
Biological Resources	Federal Endangered Species Act of 1973; California Endangered Species Act of 1973; Executive Order 11990 of 1977 (Wetlands Protection); Executive Order 11988 of 1977 (Floodplain Management).	San Joaquin County Multi-Species Habitat Conservation and Open Space Plan.
Noise Analysis	Federal Aid Highway Act of 1970; Federal-Aid Highway Program Manual 7-7-3 and the guidelines of the FHWA Technical Advisory Manual T6640.8A; Caltrans Highway Design Manual, Chapter 1100.	City of Lodi General Plan and EIR, San Joaquin County General Plan and EIR, Solano County General Plan and EIR
Hazardous Waste	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Resource Conservation and Recovery Act of 1976 (RCRA).	City of Lodi General Plan and EIR, San Joaquin County General Plan and EIR, Solano County General Plan and EIR.
Cultural Resources	National Historic Preservation Act of 1966 (NHPA), as amended (16 U.S.C. 470 et seq) and the Section 106 process.	City of Lodi General Plan and EIR, San Joaquin County General Plan and EIR, Solano County General Plan and EIR.
Air Quality	United States Clean Air Act of 1970, as amended in 1990 (42 USC 7401 et seq) and the Intermodal Surface Transportation Efficiency Act of 1991 (23 USC 109(j), 134(1), 135, 149).	San Joaquin Valley Air Basin Plan, City of Lodi General Plan and EIR, San Joaquin County General Plan and EIR, Solano County General Plan and EIR.
Water Quality	United States Clean Water Act of 1987, as amended (33 USC 1300 eq seq.) and the Porter-Cologne Water Quality Control Act of 1969, as amended in 1991 (California Water Code Sections 1300 et seq).	City of Lodi General Plan and EIR, San Joaquin County General Plan and EIR, Solano County General Plan and EIR, and Hydrologic Modeling for the Sacramento and San Joaquin Basins, 6-22-05.
Visual Resources	Federal Highway Administration (FHWA).	County General Plans, City General Plans.
Army Corps of Engineers, Section 404		
California Department of Fish and Game, Section 1602		
Coast Guard Bridge Permit		
State Land Commission Permit		

2.6 Environmental Resource Issues

2.6.1 Air Quality

The study corridor is within an area that is designated as non-attainment for ozone and particulate matter. Conformity to the State Transportation Improvement Program (STIP), local Clean Air Plans, and the Federal Clean Air Act cannot be determined until the improvement alternatives are funded. A determination of conformity will be an important aspect of the environmental process.

2.6.2 Archeological Resources

Only small portions of the study area have been surveyed for archaeological resources; no prehistoric or historic-era sites have been recorded within the proposed study corridor. An intensive archaeological survey that includes an inventory for prehistoric and historic-era resources will be necessary as part of the environmental planning phase. The study schedule could be extended by several months to more than one year if evaluations of significance and/or determinations of effect are necessary. Compliance with Section 106 of the National Historic Preservation Act (1966) and adherence to current Caltrans guidelines will be necessary.

2.6.3 Historical Resources

In compliance with Caltrans standards, all structures and numerous commercial establishments over 45 years of age must be inventoried and evaluated. The existing Rio Vista Bridge, constructed in 1944, is listed in the National Register of Historic Places (NRHP). Both direct and indirect impacts to NRHP-eligible structures must be addressed during the environmental planning phase.

2.6.4 Biological Resources

Habitats within the study area (including sensitive habits) support a wide range of special-status species. In addition to the Sacramento River and other major water features, a number of smaller stream courses and other hydrographic elements may be delineated as wetlands or other waters of the United States that are subject to Corps of Engineers permitting. Focused, intensive surveys (performed during the appropriate time of year) will be needed to identify specific impacts to special-status species and wetlands, and to identify feasible mitigation measures to avoid or reduce significant adverse impacts. Management of the Delta smelt and winter-run chinook salmon fisheries in the Sacramento River may adversely affect construction activities within the river channel. Clarification of biological issues and impacts through agency contacts (e.g., National Marine Fisheries Service) at an early date will be essential to the successful completion of the environmental planning stage.

2.6.5 Floodplains

The construction of roadways and bridges may involve encroachment upon 100-year floodplains associated with the Sacramento River and other waterways in the study area. A Location Hydraulic Study must be performed to delineate floodplain issues; proper design and construction methods should lead to the avoidance of a "significant encroachment," as defined by the FHWA.

2.6.6 Hazardous Waste/Materials

The acquisition of properties involving hazardous contamination may involve demolition, tank removal, and remediation tasks. A Phase I investigation will be needed to ascertain the nature and location of possible undocumented, underground contamination associated with adjacent ownership where signs of surface staining and other factors suggest contamination may exist.

2.6.7 Noise Receptors

The noise impacts to adjacent receptors will be assessed. Sound barriers may be necessitated at certain locations in order to mitigate significant increases in traffic noise resulting from construction of improvement alternatives.

2.6.8 Land Use Impacts

Potential socioeconomic impacts associated with these study efforts include the acquisition of private property and/or commercial establishments for future right-of-way needs, restrictions on existing highway access, modifications to existing traffic flow patterns, conformity to the local General Plans and other planning documents, and the potential for growth inducement. These issues should be addressed during the environmental planning phase by significant public involvement efforts and technical impacts assessments.

2.6.9 Visual Receptors

Landscaping and/or the placement of aesthetically pleasing barriers related to noise impacts may be necessitated at certain locations in order to mitigate significant adverse impacts to the existing visual environment that could result from construction of improvement alternatives.

2.6.10 Water Quality

Water quality impacts resulting from construction activities and operational usage of the proposed improvement alternatives could be significant. Erosion control practices (including re-vegetation) and standard design for handling roadway runoff will be needed to mitigate potential impacts. Water quality issues associated with work in rivers and other waterways may necessitate coordination with agencies such as the Regional Water Quality Control Board, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the California Department of Fish and Game.

2.7 Environmental Constraints

2.7.1 Biology and Wetlands

Coordination and consultation with the USFWS, ASFWS, ACOE, CDFG, and the Environmental Protection Agency (EPA) should be undertaken to delineate the function, importance, location, and quality of the wetland habitat to be disturbed. The resource agencies have developed a policy of "no net loss of wetland habitat value." The proponent of improvement alternatives would have to design improvement alternatives and develop mitigation measures for significant impacts if the wetland habitat on-site would be affected by the improvement efforts. The ACOE, in conjunction with the USFWS, would require a 404 permit for any fill placed in wetlands and a 401 permit for any construction activity which would obstruct navigable waters of the United States (e.g., the Sacramento River). The CDFG would also require a Section 1602 permit for any streambed alteration resulting from implementation of improvement alternatives. The wetland evaluation, in accordance with Executive Order 11990, must provide a summary of the results that describes the efforts of the improvement alternative designers to develop construction alternatives that would avoid impacts to wetlands. The summary must also contain documentation of all reasonable measures developed during the course of the improvement alternatives to minimize wetland impacts.

Section 503 (Watershed Management, Restoration and Development) of the Water Resources Development Act of 1996 (WRDA96) would need to be compared with thorough adherence to the Planning Guidance Letter No. 97-8. Watershed Management, Restoration, and Development.

2.7.2 Floodplain Encroachment

The study area is protected by levees along the banks of the rivers and the system of levees maintained by the ACOE throughout the Delta. A Location Hydraulic Study should be prepared for each location (including culverts) that might impact the wetlands. "Significant encroachment, " as defined by the *Federal Highway Administration Manual* (Volume 6, Chapter 7, Section 3, Part 2), should be avoided in the study area through careful construction design.

2.7.3 Land Use and Relevant Planning

Construction of the proposed improvement alternatives could result in land use impacts due to the need for a large right-of-way acquisition and probable closure of some local street access to the highway. Several business operations in the affected area may suffer due to relocation as a result of improvement efforts. Socioeconomic analysis will need to be conducted as it relates to potential blight.

The environmental document to be prepared for each phase of the study must also address the potential for growth inducing impacts and adverse impacts to existing farmland. Short-term and long-term impacts must be considered, as well as conformity

to the local General Plans and other planning documents. These issues will be addressed in the Program EIR and subsequent EIR's.

Impacts to existing businesses and residences should be minimized or avoided by design of the improvement alternatives. Property owners should be notified and consulted as soon as possible in the event of unavoidable impacts. It is recommended that the Caltrans Right-of-Way Office and the Caltrans Relocation Program be contacted at the earliest possible date for coordination purposes.

2.7.4 Water Quality

Construction of the proposed improvement alternatives may result in water quality impacts in the rivers and other wetlands (e.g., vernal pools, creeks, and sloughs) within the areas under consideration. In addition, highway runoff represents a potential water quality impact. These concerns are significant issues given the sensitivity of the Delta region in general, and because of the potential adverse impacts to special-status species. The proper incorporation of roadside drainage facilities and standard erosion control practices should be implemented, along with the conditions defined in the U.S. Water Quality Act of 1987, ACOE 404/401 Permit, the CDFG 1602 agreements, and other applicable laws, regulations, guidelines, and permitting requirements.

2.7.5 Soils

The Delta region is underlain with "peat" soils. These soils would need to be removed and re-compacted in areas where they are identified and where construction would take place.

2.8 Regional Environmental Issues

2.8.1 Impacts from the Port of Oakland

With expected container ships being unloaded from the Port of Oakland destined to all points east, it is estimated that up to 3,000 trucks a day could impact the region's highway system. Existing truck traffic has shifted to SR 12 to avoid congestion on I-80. However, the use of the narrow and visually limited SR 12 has created even greater safety concerns for the corridor. In addition, anticipated efforts to barge containers up the Sacramento River to bypass the Bay Area congestion will dramatically increase the uptime of the bridge crossing at Rio Vista.

2.8.2 Realignment of SR 113

One potential regional solution to relieve congestion is to realign SR 113 from Yolo County, north of Dixon, to intersect SR 12 at Birds Landing Road. It would extend over the Sacramento River near a potential deepwater port at Collinsville, intersecting SR 4 in Contra Costa County. This limited-access road, which would function similar to SR 113 in Yolo County, gives the region an expanded capability to move goods and services between the growth areas in the East Bay and the greater Sacramento area.

2.8.3 I-505 Connection to SR 99

Another potential regional solution to relieve congestion is to spur I-505 north of Vacaville to the north of Rio Vista and Lodi. It would continue across the Sacramento River and a flood-resistant causeway through the delta to SR 99. This would give the region a roadway through the subsiding delta islands, a bridge over the Sacramento River that would decrease delays for traffic bound for the port of Sacramento, and would pull north-south truck traffic out of the Sacramento commute pattern by creating a southern and western beltway for the greater Sacramento area.

2.9 Geotechnical Issues

As part of the Highway 12 Passing Lanes and Shoulder Widening project (10-SJ-12 KP 0.2/16.3), Caltrans recently performed a geotechnical investigation of widening the existing fill embankment on SR 12 between the Mokelumne River Bridge and the Potato Slough Bridge. The improvement efforts would provide passing lanes for both eastbound and westbound traffic and would widen the shoulders.

The site is underlain by a significant amount of compressible soil. Layers of peat and soft clay underlay the site to a typical thickness of 40 feet. The existing embankment has historically experienced significant settlement damage, requiring significant efforts by maintenance to keep the highway in acceptable condition. Construction of the new fill would be expected to result in significant settlements.

As part of this geotechnical investigation, Caltrans recommended wick drains, surcharge loading, lightweight fill, staged construction and an instrumentation program to mitigate long-term settlement damage resulting from the new fill placement. Lightweight fill options include traditional lightweight aggregate and polystyrene, which has a larger reduction in the weight of fill material. Polystyrene and the soil mixing option could be considered experimental features on construction improvements, making them eligible for special contracting privileges. Caltrans is the lead on a deep soil mixing project, and they are looking for technology deployment sites. Interest and funding may be used to supplement the cost of this alternative.

2.10 Existing Projects in Planning Phase

A number of enhancement projects within the study corridor are currently in the planning phase. Table 2.8 presents these projects.

Table 2.8: SR 12 Projects in Planning Phase

Location	Description	Construction Cost Estimate	Program	Schedule
Mokelumne River Bridge	Replace Damaged Beam and Control House	$4,000,000	SHOPP	Draft Project Initiation Document (PID) – No Schedule at this time
From Mokelumne River Bridge to Potato Slough Bridge (Bouldin Island)	Rehabilitate Roadway	$33,000,000	SHOPP	2013
Mokelumne River Bridge	Rehabilitate Deck	$606,000	MINOR	October 2006
Mokelumne River Bridge	Electrical Improvements	$400,000	MINOR	January 2007
Mokelumne River Bridge to SR-99	Widen to 4 Lanes	$10,500,000 [1]	2004 SJCOG RTP & 2005 Amendment	2020
Near Terminous Road from Sacramento County Line to I-5 – Bouldin Island Passing Lanes	Add Passing Lanes at 2 Locations	$16,034,000	1998 STIP	March 2015
From I-5 to Sacramento County Line	Improve Safety	$5,100,000	2004 SJCOG RTP & 2005 Amendment	2015
Potato Slough Bridge and Near Manteca at W120-NS Connector OH	Replace Bearing Pads	$1,800,000	SHOPP	July 2006
Near Terminous Road	Add Passing Lanes at two Locations and Widen Shoulders	$14,459,000	STIP (Awaiting Corridor Study)	Draft (PID) – No Schedule at this time
Near Little Potato Slough on SR 12 and on SR 99 at Mokelumne River Bridge	Remove AC/Methacrylate Bridge Decks	$700,000	MINOR	To be determined
From Potato Slough Bridge to Guard Road (near I-5)	Structural Section Repair	$3,956,000	SHOPP	Draft (PID) – No Schedule at this time
Intersection of Kettleman Lane and Davis Road	Install New Signal	$304,000	MINOR	October 2006

Note: [1] Cost represents preliminary engineering, environmental phase, and/or phase of construction of project.
Source: Caltrans.

3 FUTURE CONDITIONS

3.1 Future Highway Operations

3.1.1 Travel Forecast Assumptions

An annual growth rate was used to determine traffic volumes for future horizon years. As presented in Section 2.1, several sources were used to determine this annual growth rate. Due to the differences in current and expected rural- and urban-oriented travel in the corridor, a consistent growth rate was not used for the entire corridor. Rather, separate growth rates were used for different sectors of the corridor. Corridor sectors were determined to account for the varying characteristics of topography, land use, development density, rural and urban travel demand and network characteristics, and the number of intersecting cross streets. Average growth rates were by each sector by averaging the annual growth rates from the following primary sources:

- Counts from Caltrans AADT;
- Counts from SJCOG regional travel model screenlines; and
- Counts from *the Route 12 in San Joaquin County Corridor Study*.

Caltrans traffic counts, at specific locations in this and other Corridors, are not conducted annually based on resource requirements and other factors. Traffic count estimates are typically developed and used by Caltrans to fill in the gaps with predictions of counts at many locations, especially those that are collected sporadically. Therefore, traffic count averages along with additional forecasting sources were used to develop and refine the traffic growth rates for the Corridor.

Caltrans growth rates were developed using traffic counts from available data since 1980. SJCOG travel model screenline growth rates were determined using travel volumes for 2005 and 2030. Rates from the *Route 12 in San Joaquin County Corridor Study* were developed using the existing (1994) and future projections (2020) prepared for these studies. Table 3.1 presents the growth rates used for each sector.

Table 3.1: SR 12 Annual Traffic Growth Rates by SR 12 Segment

SR-12 Sector	Calculated Growth Rate			
	Caltrans	SJCOG Model	SR12 Study	AVERAGE
West of SR 160	3.53%			**3.53%**
SR 160 to Terminous Road	2.16%	0.98%		**1.57%**
Terminous Road to Guard Road	2.63%	0.98%	1.76%	**1.79%**
Guard Road to Lower Sacramento Road	2.48%		4.03%	**3.26%**
Lower Sacramento Road to South Ham Lane	3.48%		1.82%	**2.65%**
South Ham Lane to South Hutchins Street	3.20%		1.42%	**2.31%**
South Hutchins Street to East of Central Avenue	1.06%		1.44%	**1.25%**
East of Central Avenue to South Cherokee Lane	2.59%		0.59%	**1.59%**
South Cherokee Lane to SR 99	2.99%		0.89%	**1.94%**

The average growth rates determined for each sector were then applied to the existing 2005 Caltrans counts within each sector to determine future traffic volumes for 2010, 2015, and 2030.

3.1.2 Horizon Years

Traffic volume estimates were prepared for 2010, 2015, and 2030 to represent designated horizon years for the SR 12 Corridor Study. These years also represented the subsequent evaluations of short-term (2010), mid-term (2015), and long-term (2030) traffic impacts and potential transportation improvement projects respectively.

3.1.3 Travel Forecasts

The modeling approach defined in Section 2.0 and above was used to project traffic growth between 2005 and 2030. Results range from 39 to 118 percent increases along the corridor. The highest growth is expected to occur between I-5 and Lower Sacramento Road and at the Rio Vista Bridge.

Table 3.2 presents daily traffic volumes in 2005 and 2030, and the absolute growth for this period for roadway segment of the SR 12 corridor.

Table 3.2: 2005 and 2030 Daily Traffic Volumes and Percentage Growth by 2030

SR-12 Segment	2005	2030	Growth in Period
Between Rte. 84 and Rte. 160	18,000	39,000	117%
East of Rte. 160	15,000	23,000	53%
West of Terminous Rd.	15,000	23,000	53%
East of Terminous Rd.	16,000	25,000	56%
West of Tower Parkway	16,000	25,000	56%
East of Tower Parkway	18,000	25,000	39%
West of Guard Rd.	18,000	25,000	39%
West of I-5 and Thornton Rd.	13,000	27,000	108%
East of Thornton Rd.	11,000	23,000	109%
West of Lower Sacramento Rd.	11,000	24,000	118%
East of Lower Sacramento Rd.	27,000	48,000	78%
West of South Ham Lane	28,000	49,000	75%
East of South Ham Lane	30,000	51,000	70%
West of South Hutchins Street	33,000	55,000	67%
East of South Hutchins Street	31,000	43,000	39%
West of Central Ave.	26,000	38,000	46%
East of Central Ave.	24,000	38,000	58%
West of Cherokee Lane	27,000	38,000	41%
Between Cherokee Lane and South Jct. Rte. 99	23,000	37,000	61%

Figure 3.1 presents the expected 2030 volumes with the band thickness showing the magnitude of traffic volumes.

Figure 3.1: 2030 Average Daily Traffic Volumes on the SR 12 Corridor

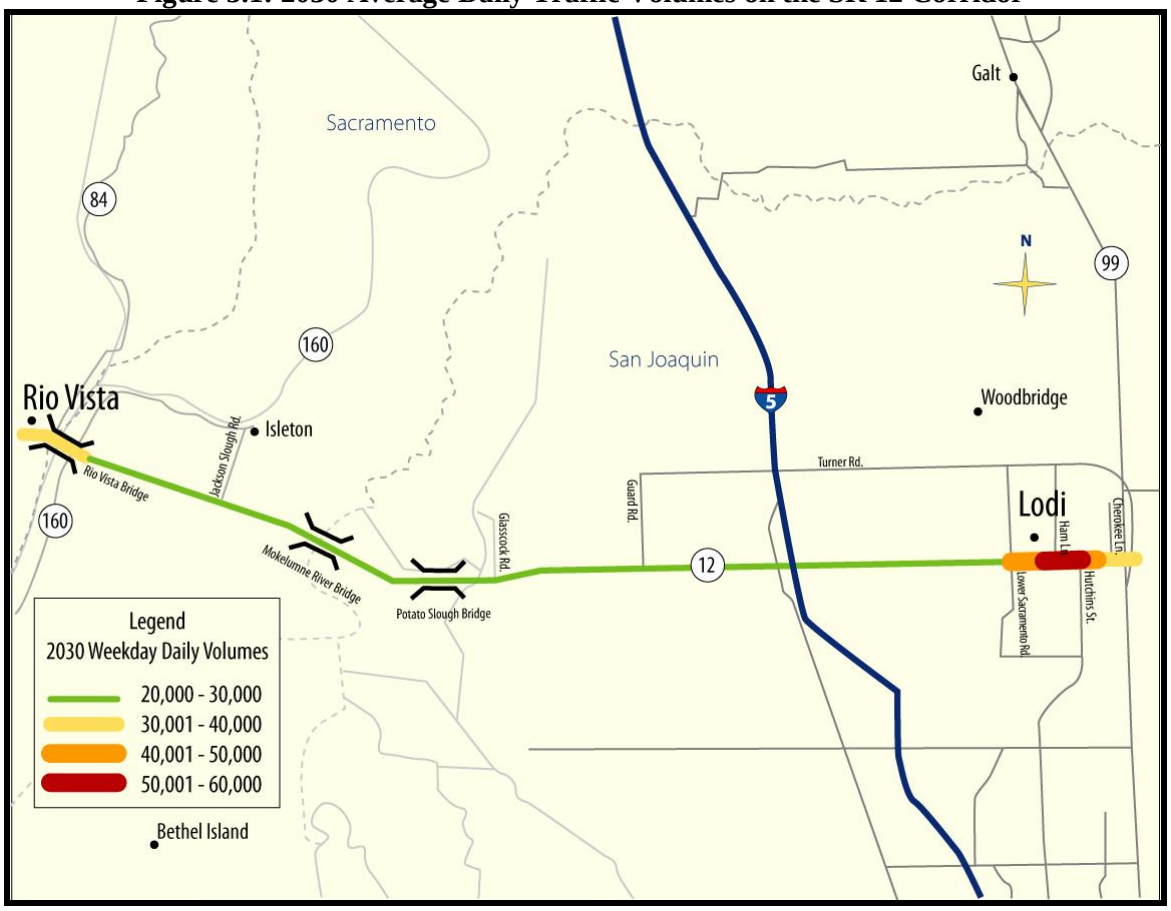
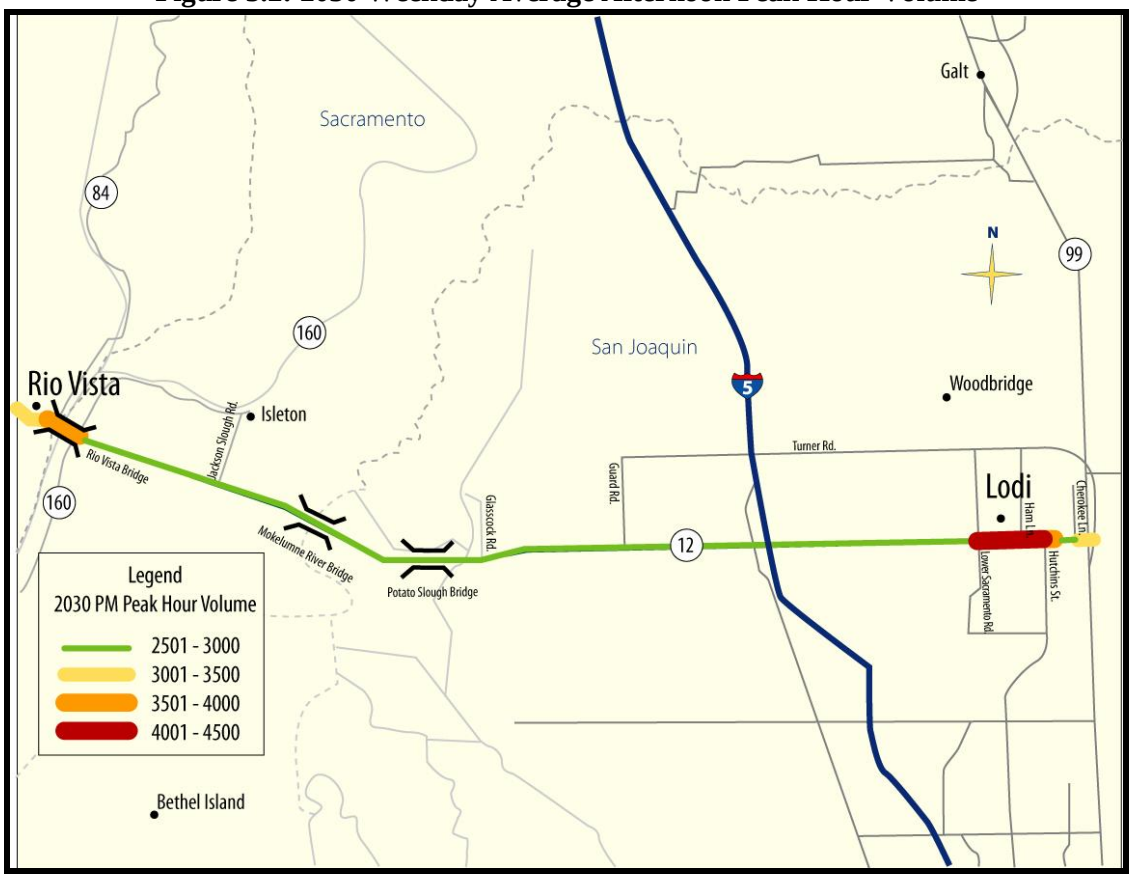


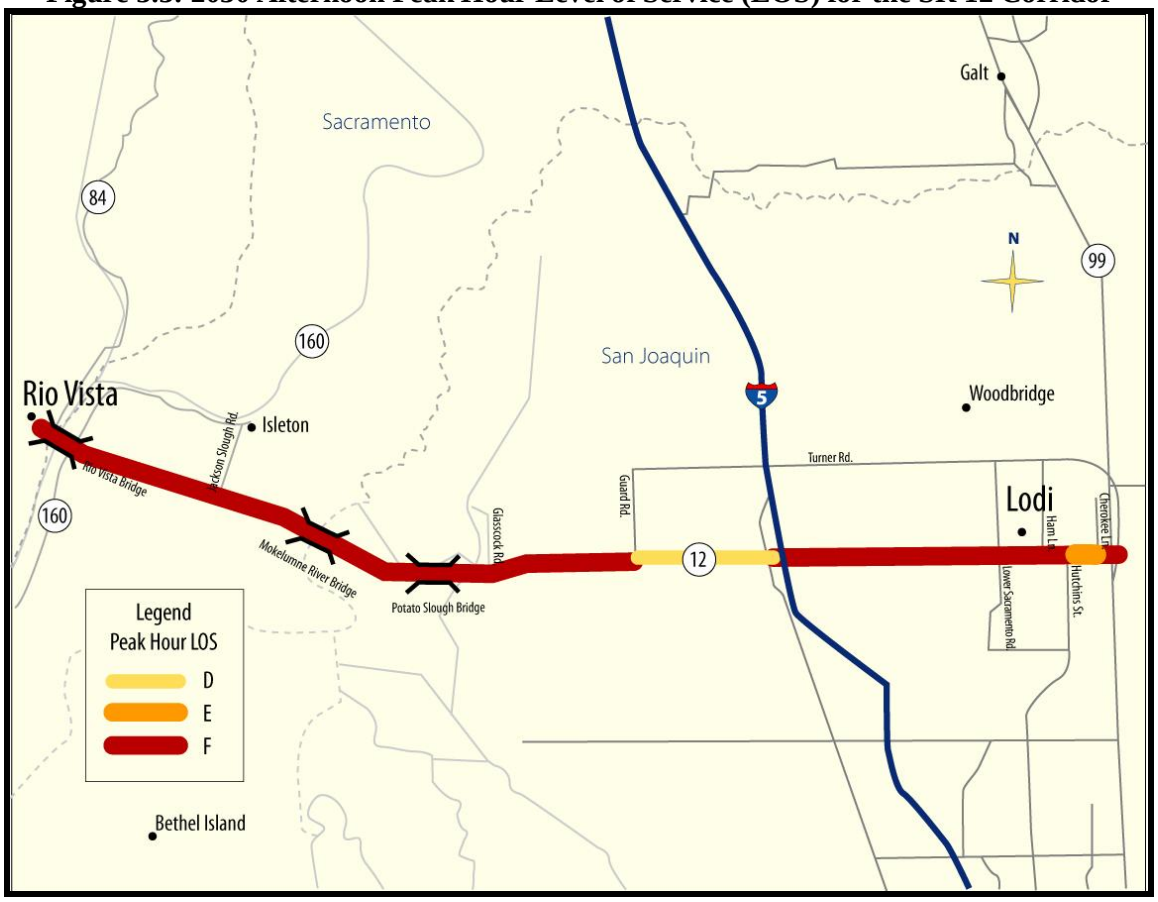
Figure 3.2 presents the projected 2030 afternoon peak hour volumes for SR 12. Traffic volume patterns in 2030 are projected to be similar to 2005 conditions, with heaviest traffic volume in Lodi.

Figure 3.2: 2030 Weekday Average Afternoon Peak Hour Volume



Without any capital improvements to the corridor by 2030, most of the SR 12 segments within the study area will operate at LOS F due to insufficient capacity to handle the projected travel volumes. Figure 3.3 presents 2030 afternoon peak hour LOS along the study corridor.

Figure 3.3: 2030 Afternoon Peak Hour Level of Service (LOS) for the SR 12 Corridor



3.1.4 Bottlenecks and Queues

The same operational constraints that exist in 2005 will persist in 2030 without any roadway improvements. Drivers will have no options to bypass any bridge openings as well as accidents that result in the closure of the highway. Queues will be longer in the future as traffic volumes are expected to increase.

3.2 Future Transit Operations

3.2.1 Bus Ridership Forecasts

It is expected that transit ridership in the future will be similar to 2005 conditions. Few transit services are currently offered for the entire length of the corridor due to insufficient demand. Most travel along SR 12 in the Delta is at the interregional level; therefore, any future transit services along the corridor are anticipated to serve long-distance commuter trips between the San Joaquin Valley and the San Francisco Bay Area. Justification for commuter bus services will depend on growth in population in Lodi and other regional and local communities such as Rio Vista. Likewise, population growth may result in increased local bus services along Kettleman Lane within Lodi city limits.

3.2.2 Bus Service Changes

3.2.2.1 Grapeline

Ridership is projected to decrease to 440,000 for 2004-2005, but increase to 470,000 for 2005-2006 (MV Transportation, Inc. "Grapeline Short Range Transit Plan", July 2005).

3.2.2.2 Rio Vista Transit

The City of Rio Vista is proposing to make major modifications to the Rio Vista Transit system to improve the transit system efficiency, cost effectiveness, and the farebox recovery ratio, in order to continue receiving the State of California Transportation Development Act (TDA) funds to support the operation of the transit system. Rio Vista Transit is purchasing new vehicles to expand direct service between the Trilogy Resort and downtown Rio Vista. It will also increase service to high-demand destinations to regional destinations to the south and east of the city.

3.2.2.3 San Joaquin Regional Transit District (SJRTD)

Routes 23, 24, and 93 provide service between the Cities of Lodi and Stockton, connecting at the Lodi Transportation Station in Downtown Lodi. The SJRTD has no plans to provide service on SR 12. Beginning January 8, 2006, virtually all of SJRTD Metro and County routes will begin operating on 30- or 60-minute intervals, rather than irregular intervals within each hour of the day.

3.2.2.4 South County Transit (SCT)

South County Transit is considering expanding service to the Delta Loop. This route would connect to transit existing services in Lodi and Rio Vista.

3.2.2.5 Solano Transportation Authority (STA)

The Solano Transportation Authority is planning to introduce a new transit service that will connect Napa, Fairfield, Rio Vista, Antioch, and Lodi in 2008 or 2009.

3.2.3 Park-and-Ride Lot Plans

According to the *Highway 12 Major Investment Study (2001)*, Solano Transportation Authority has plans to construct a park-and-ride lot in the City of Rio Vista. The lot would be designed to accommodate fifty automobiles, but it could be expanded if demand is high enough. The lot would be constructed at a location visible from SR 12, and signage would be installed on the highway identifying it as a park-and-ride facility. The exact location of the lot would be driven by land availability. Possible locations include downtown and near the intersection of SR 12/Church Street. A local advertising campaign would be undertaken to publicize the new facility and the benefits of carpooling. The advertising campaign would also emphasize the use of the Solano Transportation Authority ride-matching service.

4 IMPROVEMENT ALTERNATIVES

4.1 Alternative Development Process

4.1.1 Field Reviews

One of the primary issues facing the development of the corridor within San Joaquin County is the preservation of agricultural land and natural resources. Many of the lands adjacent to the study area include orchards, vineyards, field and row crops, valley grasslands, and aquatic and terrestrial habitats. Prior to developing improvement projects, the Kimley-Horn team reviewed existing land use and ownership data throughout the corridor. In conjunction with this effort, field investigations and photographic documentation were conducted to assess areas with potential environmental and geological issues.

4.1.2 Stakeholder/Steering Committee Meetings

Four stakeholder/steering committee meetings were held near the study area between June 2005 and October 2005. At these meetings, the consultant team and stakeholders discussed consultant work progress, existing corridor conditions, travel forecasting and modeling issues, environmental constraints, possible project alternatives, project sequencing, and planning-level costs. The stakeholders discussed the project findings and provided important feedback on technical issues.

4.1.3 Public Meeting

A public meeting was held at Tower Park between the Cities of Rio Vista and Lodi in November 2005 to discuss the project alternatives and receive input from the public.

According to area residents, the project goals and priorities should be the following:

- Safety is the primary goal and should not be sacrificed for higher speed on SR 12.
- Passing lanes may decrease safety by increasing certain maneuvers.
- A median barrier would be an effective way to increase safety.
- Localized improvements are needed now to address safety problems.
- Widening SR 12 sooner rather than later would save money and address the corridor's problems.

Public opinion was considered and incorporated into the definition and evaluation of the improvement alternatives where possible. Some of those in attendance expressed concerns with passing lanes and median barriers, citing personal experiences of unsafe incidents from existing facilities.

The Appendix includes detailed meeting minutes from this public meeting.

4.1.4 Cost Versus Utility Issues

At the public meeting held in November 2005, the public expressed their desire to have the entire SR 12 study corridor widened in the near term to mitigate existing and future roadway operation issues before inflation increases construction costs. According to the Caltrans District 10 Director, the SR 12 study corridor will not receive sufficient annual funds to cover all the proposed improvement alternatives at once. Because of funding constraints and construction timing issues, smaller-scale project alternatives are necessary in the near-term in lieu of full buildout of SR 12 to either 4 or 6 lanes.

4.1.5 Logical Termini

In 1997 Caltrans completed a Project Study Report to construct a Passing Lane project in the Bouldin Island area. However, FHWA expressed concern regarding this project and requested a more comprehensive study along SR 12 to check the validity of Logical Termini and Independent Utility requirement for roadway planning.

FHWA requires that a roadway improvement project consider an integrated project as they proceed through planning, environment, design, and construction stages. An integrated project would satisfy an identified need (such as safety, capacity, economic impact, etc.) and consider the local area socioeconomics, topography, future travel demand, and other infrastructure improvements in the area. This approach to a roadway improvement project would help satisfy the intended project while avoiding unintended side effects that could require subsequent corrective action. Additionally, environmental issues and transportation needs would be addressed for the corridor as a whole, instead of in segments.

The FHWA outlines three general principals for Project Termini (23 CFR 771.111(f)) that should be evaluated in each environmental impact statement (EIS):

1. Projects should connect logical termini and be of sufficient length to address environmental matters on a broad scope;
2. Projects should have independent utility or independent significance, i.e. be usable and be a reasonable expenditure, even if no additional transportation improvements in the area are made;
3. Projects should not restrict the consideration of alternatives for other reasonably foreseeable transportation improvements.

Logical termini for project development are defined as (1) rational end points for a transportation improvement, and (2) rational end points for a review of the environmental impacts.

For the SR 12 Corridor study one of the important factors for consideration was the Logical Termini and Independent Utility requirements. All projects were evaluated with the consideration of these requirements.

4.2 Types of Improvement Alternatives

After future conditions were defined, 22 projects were identified for consideration. These 22 projects were then placed into four overall groups as described in the subsequent sections.

Each of the improvement alternative projects can be categorized under one of two classifications: operational enhancements or capacity enhancements.

4.2.1 Operational Enhancements

Operational enhancements will improve traffic conditions on SR 12 with little modification to the roadway. These measures aim to inform drivers of traffic incidents, encourage alternative modes of transportation, and improve localized road operations.

The following sections describe possible operational enhancements for the SR 12 corridor.

4.2.1.1 Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) are technologies that are designed to more effectively move automobiles and transit by conveying information to the traveling public. ITS can include a network of dynamic message signs (DMS), trailblazer signs, and closed circuit television (CCTV) to monitor conditions and provide real-time traffic information. These devices provide improved incident management and motorist notification. Once an incident is detected, information regarding estimated delay time and possible alternate routes would be disseminated to the drivers upstream.

All ITS should conform to the following guidelines:

- FHWA regulations regarding ITS project and their required linkage to a Regional ITS Architecture (http://www.ops.fhwa.dot.gov/its_arch_imp/policy.htm)
- Regional ITS Architecture taken from San Joaquin Valley ITS Strategic Plan (http://www.mcag.cog.ca.us/sjvits/)
- California Statewide ITS Architecture (http://www.kimley-horn.com/Caarchitecture/)

4.2.1.2 Transportation Demand Management

The primary purpose of Transportation Demand Management (TDM) is to reduce the number of vehicles using highway facilities while providing a wide variety of mobility options for those who wish to travel. It aims to influence traveler behavior for the purpose of reducing or redistributing travel demand. Examples include Park and Ride facilities and transit services.

4.2.1.3 Local Intersection Improvements

Local intersection improvements are recommended at selected intersections to improve operations and safety. Improvements include additional turning lanes, through lanes, acceleration lanes, and deceleration lanes.

4.2.1.4 Passing Lanes

Passing lanes are a means to improve operations on SR 12 in lieu of full buildout of the road to 4 or 6 lanes. These passing lanes would be 12 feet in width for each direction of travel. Each passing lane would be approximately one mile in length, with a one- to two-mile spacing between each. No median barriers would be constructed.

The public has raised concerns with the perceived safety of existing passing lanes in Solano County west of Rio Vista. Locals have observed motorists driving fast while in the passing lanes, including the use of excessive speeds and last-moment passing maneuvers. However, the proposed passing lanes allow sufficient length to pass vehicles (1 mile) while not providing excessive length that encourages the lanes to be used as standard travel lanes. Providing adequate spacing between successive passing lanes will allow drivers to make frequent passing maneuvers. Excessive driving speeds are issues that should be addressed by California Highway Patrol (CHP).

4.2.2 Capacity Enhancements

Capacity enhancements improve traffic conditions on SR 12 by providing additional travel lanes or alternate roadways. The following sections describe possible capacity enhancements for the SR 12 corridor.

4.2.2.1 Roadway Widening

Widening the study corridor to 4 or 6 lanes along selected sections of roadway would achieve the desired LOS by providing additional capacity for projected traffic growth.

4.2.2.2 Bridge Replacement or Bridge Widening

Widening the three existing bridges along the study corridor would provide additional capacity to improve operation on SR 12. and eliminate vehicles queues that result from bridge openings.

Under the General Bridge Act of 1946, proposed bridge plans must be approved by the Commandant, U.S. Coast Guard, prior to commencement of construction. Applications for bridge replacement or widening must clearly convey their environmental impacts.

4.2.2.3 Elevated Structure (Viaduct)

A new elevated viaduct structure between Rio Vista and the Potato Slough Bridge will provide an effective alternative to modifying the existing SR 12 roadway and will provide additional capacity for acceptable roadway LOS operations for future conditions. It will also provide reduced environmental impacts compared to widening the existing

roadway and increase safety by providing grade-separated intersections with local roads. The estimated cost to construct a viaduct structure is $571.9 million dollars.

4.2.2.4 Tunnels

As an alternative to an elevated structure, underwater tunnels would provide another means to cross the three bodies of water along the study corridor. Tunnels would prevent interference between vehicle traffic on SR 12 and ship traffic on the waterways.

The costs to construct tunnels were estimated to be the following:

- Rio Vista - $500 million
- Mokelumne River - $300 million
- Potato Slough - $200 million

4.3 Project Group 1: Implement Transportation Systems Management / Transportation Demand Management

Improvements in Project Group 1 were developed with a focus on low-cost, short-term solutions: motorist information systems and transit enhancements.

Three Transportation Systems Management and Transportation Demand Management (TSM/TDM) improvement alternatives were developed as part of Project Group 1. They are described below.

4.3.1 Project 1 – Implement Motorist Information and Management System

Project 1 will establish a motorist information and incident management system that will more effectively move automobiles and transit and convey information to the traveling public. The following devices would provide improved incident management and motorist notification:

- Install Changeable Message Signs on I-5 and SR 99 for incident notification and on SR 12 for travel time notification.
- Install monitoring stations and weather stations.
- Install closed circuit TV for incident verification.
- Install highway advisory radio for motorist information.
- Integrate Caltrans District 10 Traffic Management Center and bridge operations with Lodi and Rio Vista Emergency Services to improve response times.

Components that alert drivers to travel conditions would be most effective west of I-5 where bridges affect traffic. Similar components on I-5 and SR 99 would alert drivers to

travel conditions before exiting onto SR 12, perhaps giving them options to take possible alternate routes.

4.3.2 Project 2 – Construct Park and Ride Facilities

Park and Ride facilities would reduce the number of vehicles using SR 12 while providing a wider variety of mobility options. As described in Section 3.2, the Solano Transportation Authority has plans to construct a park-and-ride lot in Rio Vista. Also, new park and ride facilities are proposed on the eastern end of the project corridor in Lodi as part of Project 2. In addition, the existing facility near I-5 should be expanded as needed.

4.3.3 Project 3 – Expand Transit Service Operation

As part of Project 3, existing weekday Rio Vista Transit service between Lodi and Rio Vista would be expanded to reduce short-term trips on the study corridor. This project would be part of a continual process into a far-term study period.

4.4 Project Group 2: 3-Lane Operational Enhancement

Project Group 2 improvements were developed following the evaluation criteria and input from stakeholders and the public. These alternatives include adding passing lanes and making localized intersection improvements. Although analysis has not been conducted on the intersection level, the roadway segment analysis completed in this study is sufficient to understand that particular intersection improvements will be needed for acceptable operation.

Twelve operational and capacity enhancements were developed under Project Group 2. Projects include passing lanes and localized intersection improvements. They are able to be constructed concurrently with Project Group 1. The 12 improvement alternatives are described below.

4.4.1 Project 4 – Widen SR 12 between Thornton Road and Flag City Boulevard

Project 4 would widen SR 12 from Thornton Road to just east of Flag City Boulevard. These additional travel lanes would increase vehicular capacity and improve roadway LOS to acceptable operations.

4.4.2 Project 5 – Widen SR 12 at Guard Road

The intersection of SR 12/Guard Road Project has been identified as a location that requires safety improvements due to the number of heavy vehicles using Guard Road to reverse their direction of travel. Project 5 would add acceleration and deceleration lanes on the north and south sides of SR 12 to provide a safer means for heavy vehicles to exit and enter the corridor.

4.4.3 Project 6 – Add Left-Turn Lane at Peatland Road

At intersections along the two-lane sections of SR 12, vehicles must block upstream traffic while waiting for an acceptable gap to turn left. Project 6 would add a westbound left-turn lane at the intersection of SR 12/Peatland Road to prevent turning vehicles from blocking upstream traffic

4.4.4 Project 7 – Add Left-Turn Lane at Correia Road

Similar to Project 6, Project 7 would add a westbound left-turn lane at the intersection of SR 12/Correia Road to help prevent blockages in the through stream of vehicles.

4.4.5 Project 8 – Widen SR 12 at Jackson Slough Road

The intersection of SR 12/Jackson Slough Road has been identified as a location that requires safety improvements. Project 8 would add acceleration and deceleration lanes on the north and south sides of SR 12 to provide a safer means for heavy vehicles to exit and enter the corridor. A traffic signal would be added to control intersection operations if warranted due to nearby future development

4.4.6 Project 9 – Realign Tower Park Way-Glasscock Road and Widen SR 12 at the Intersection

The intersection of SR 12/Tower Park Way-Glasscock Road has been identified as a location in need of safety improvements. The main concern is the short sight distance provided by the unconventional intersection alignment. Project 9 would realign the intersection of SR 12/Tower Park Way-Glasscock Road to a conventional layout and lengthen the south intersection leg. SR 12 would be widened to four lanes at the intersection to provide increased capacity. If warranted, a traffic signal would be installed.

4.4.7 Project 10 – Widen SR 12 at Terminous Road

Project 10 would add an eastbound left-turn lane at Terminous Road to prevent turning vehicles from blocking the flow of traffic. An alternative treatment would be to combine Terminous Road with Brannan Isle Road, which is located approximately 1000 feet east of the SR 12/Terminous Road intersection.

Refer to Appendix B for public comment on recommended configuration

4.4.8 Project 11 – Widen at SR 12 at SR 160

Project 11 would widen SR 160 at the intersection of SR 12 to include one left-turn lane and two through lanes in each direction. Right-turn lanes would be added on SR 160 depending on the level of future development north of SR 12.

4.4.9 Project 12 – Add Passing Lanes on SR 12 between Flag City Boulevard and Westgate Road

In lieu of immediately constructing additional travel lanes on SR 12, adding passing lanes would provide an alternate means of improving roadway operations and LOS. Project 12 would add passing lanes on SR 12 between Westgate Road and Flag City Boulevard. These passing lanes would be 12 feet in width for each direction of travel. Each passing lane would be approximately one mile in length, with a one- to two-mile spacing between each. No median barriers would be constructed.

4.4.10 Project 13 – Add Passing Lanes on SR 12 between Potato Slough Bridge and I-5

Similar to Project 12, Project 13 would add passing lanes on SR 12 between the Potato Slough Bridge and I-5. These passing lanes would be 12 feet in width for each direction of travel. Each passing lane would be approximately one mile in length, with a one- to two-mile spacing between each. No median barriers would be constructed.

4.4.11 Project 14 – Add Passing Lanes between Potato Slough Bridge and Mokelumne River Bridge

Project 14 would add passing lanes on SR 12 between the Potato Slough Bridge and the Mokelumne River Bridge. These passing lanes would be 12 feet in width for each direction of travel. Each passing lane would be approximately one mile in length, with a one- to two-mile spacing between each. No median barriers would be constructed. Overlay would be added to existing pavement to correct roadway settlement.

4.4.12 Project 15 – Add Passing Lanes between Mokelumne River Bridge and SR 160

Similar to Project 14, Project 15 would add passing lanes on SR 12 between the Mokelumne River Bridge and SR 160. These passing lanes would be 12 feet in width for each direction of travel. Each passing lane would be approximately one mile in length, with a one- to two-mile spacing between each. No median barriers would be constructed. Overlay would be added to existing pavement to correct roadway settlement.

Figure 4.1 presents the projects in Group 2.

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GROUP 2 IMPROVEMENT ALTERNATIVES

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4.5 Project Group 3: 4 to 6 Lane Capacity Enhancement

Projects slated in this project group are designed to be built successively after Project Group 2 improvements. No reconstruction on any projects already completed will be needed. For example, passing lanes are proposed between Flag City Boulevard and Lower Sacramento Road under Project Group 2. One of the Project Group 3 improvements will widen SR 12 to four lanes on this segment by adding a fourth lane to the three lanes already built under Project Group 2.

Six capacity enhancements were developed under Project Group 3. These projects include widening SR 12 to either 4 lanes or 6 lanes and widening the Mokelumne River Bridge and Potato Slough Bridge. The six improvement alternatives are described below.

4.5.1 Project 16 – Widen SR 12 to 6 Lanes between Lower Sacramento Road and S Cherokee Lane

Project 16 would widen SR 12 to 6 lanes between Lower Sacramento Road and Cherokee Lane. It would also widen SR 12 at the Union Pacific Railroad crossing and modify the traffic signals as necessary.

4.5.2 Project 17 – Widen SR 12 at SR 99 between S Cherokee Lane and Beckman Road

Project 17 would widen SR 12 to 6 lanes between Cherokee Lane and Beckman Road in the vicinity of SR 99. In addition, the interchange and traffic signals would be modified to accommodate the new lanes.

4.5.3 Project 18 – Widen SR 12 to 4 Lanes between Flag City Boulevard and Lower Sacramento Road

Project 18 would widen SR 12 to 4 lanes between Flag City Boulevard and Lower Sacramento Road to provide additional vehicular capacity

4.5.4 Project 19 – Widen or Replace Mokelumne River Bridge

Project 19 would widen the existing Mokelumne River Bridge to 4 lanes, or replace the existing bridge. The final recommendation will be based on future feasibility studies.

4.5.5 Project 20 – Widen or Replace Potato Slough Bridge

Project 20 would widen the existing Potato Slough Bridge to 4 lanes, or replace the existing bridge. The final recommendation will be based on future feasibility studies.

4.5.6 Project 21 – Widen SR 12 to 4 Lanes between Rio Vista Bridge and I-5

Project 21 would widen SR 12 to 4 lanes between the Rio Vista Bridge and I-5. A concrete barrier would be installed in the roadway median. This project would complete the necessary widening of SR 12 within the study corridor.

An alternative to widening SR 12 would be to construct a viaduct between the Rio Vista Bridge and the Potato Slough Bridge, which would parallel the existing layout of SR 12. Existing bridges could remain to serve the local traffic or be removed.

Figure 4.2 presents the projects in Group 3.

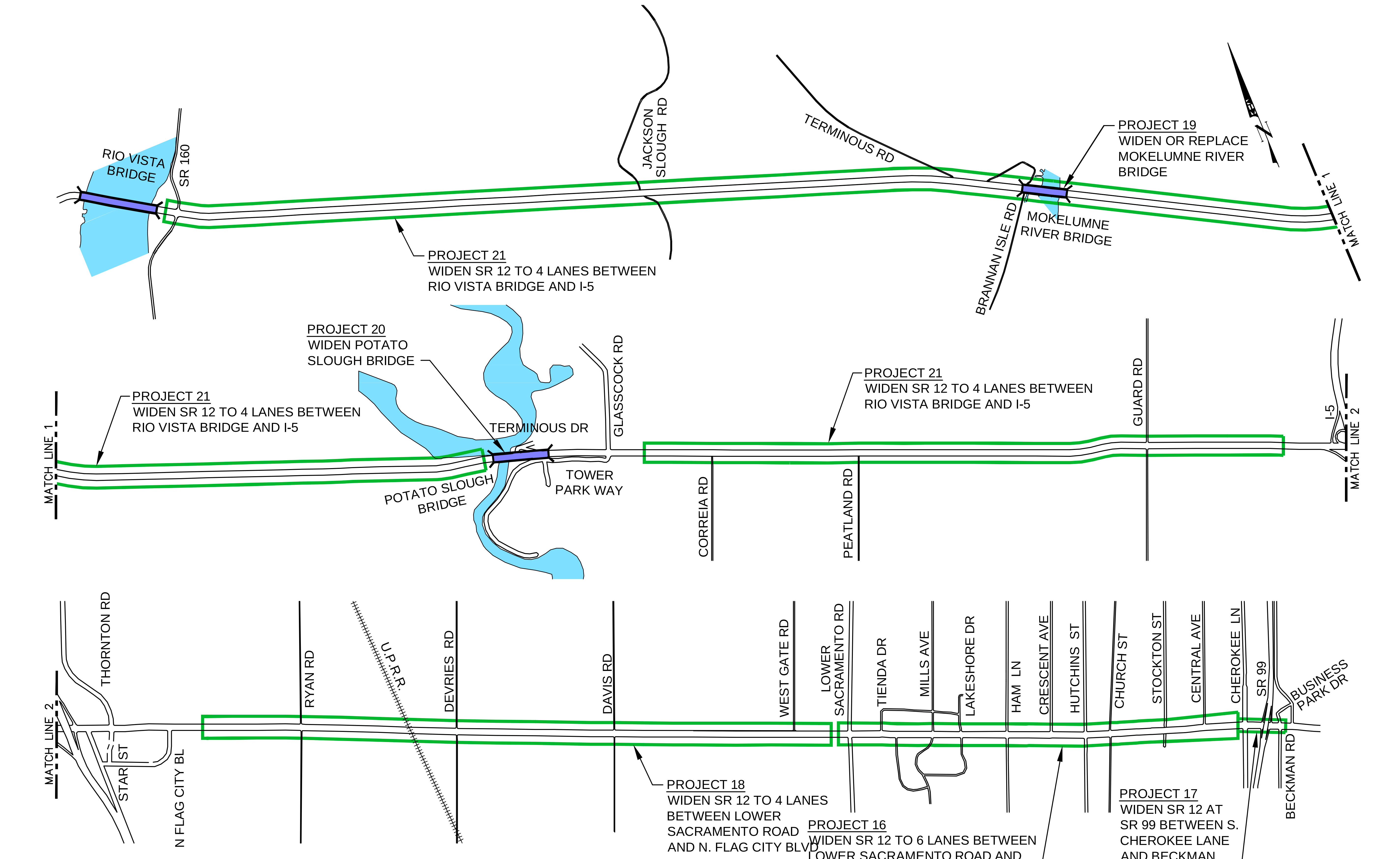
4.6 Project Group 4: Rio Vista Bridge Replacement

The final improvement alternative would widen or replace the Rio Vista Bridge. Because of the estimated cost of this project, it has been placed in its own project group.

4.6.1 Project 22 – Widen or Replace Rio Vista Bridge

Project 22 would widen the existing Rio Vista Bridge to 4 lanes, or replace the existing bridge. Approximately $500,000 in federal SAFETEA-LU earmark funds were awarded to the City of Rio Vista for a Rio Vista Bridge Study and Signage Improvement Project, which would evaluate possible alternatives and make a final recommendation. The City of Rio Vista is working with the STA and Caltrans District 4 to commence this study.

STATE ROUTE 12 COMPREHENSIVE TRANSPORTATION CORRIDOR STUDY
GROUP 3 IMPROVEMENT ALTERNATIVES



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5 EVALUATION OF IMPROVEMENT ALTERNATIVES

5.1 Evaluation Criteria

5.1.1 Traffic Operations

In order to evaluate the impact to roadway operations of each proposed project, roadway LOS analyses were conducted on a planning level. These analyses were conducted for roadway segments only and not for localized intersections.

5.1.2 Safety

The safety benefits of each proposed improvement alternative were assessed when applicable.

5.1.3 Right-of-Way Requirements

Conceptual right-of-way needs were identified for each project. These were used to calculate planning-level costs for each project.

5.1.4 Environmental Constraints

Influences and enhancements to wetlands, endangered species, and air quality were identified.

5.1.5 Costs

Planning-level costs were developed for each project based on costs of construction, right-of-way needs, design engineering, and environmental clearance. Worksheets for each project are included in the Appendix, excluding those costs provided by other outside sources (Projects 3, 17, and 22).

5.1.6 Logical Termini and Independent Utility

Each project was evaluated based on FHWA's Logical Termini and Independent Utility consideration in developing the project types and segmentation.

5.2 Project Group 1 Improvements

The total estimated cost for the three improvement alternatives in Project Group 1 is $10.7 million. Table 5.1 summarizes improvements with respect to enhancing features, measures of improvement, environmental impacts, and planning-level costs.

Table 5.1: Project Group 1 Improvement Alternatives

Project	Description and Features	Capacity Enhancing Features and Measure of Improvements	Other Features	Environmental Assessment (Impacts and Benefits)	Order of Magnitude Costs (Planning Level) 2005 Dollars
1. Implement Motorist Information and Incident Management System	1) Install Changeable Message Signs on I-5 & SR 99 for incident notification and on SR 12 for travel time notification; 2) Install Monitoring Stations and Weather Stations for monitoring; Install Closed Circuit TV for incident verification; 3) Install Highway Advisory Radio for motorist information; and 4) Integrate Caltrans District 10 TMC and Bridge Operation with Lodi and Rio Vista Emergency Services to improve response times.	• Reduces demand due to travel time shift • Potential bypass and diversion as a result of early notification • **Assumes up to 28% of vehicles passing sign could save time, shift route, leave later (Based on 10% sign activation)**	• Safety enhancement • Motorist information system	• Limited physical impacts. No impacts to wetlands. • Reduction in emissions as a result of increased traffic flow.	**$8.0 million**
2. Construct Park and Ride Facilities	5) Construct park & ride facilities near Rio Vista Bridge and Expand existing facility near I-5	• Reduces single-occupancy vehicle (SOV) demand in the corridor • **Reduces Single Occupant Vehicle (SOV) travel by less than 1%**	• Improves traveler access in corridor by supporting additional mode choice	• Limited physical impacts. Area of potential construction is already developed. No impacts to wetlands are expected. • Reduction in emissions as a result of increased traffic flow.	**$2.2 million**
3. Expand Transit Service Operation	6) Expand weekday service between Lodi and Rio Vista. (There is a current service between Lodi and Isleton [four trips per day]).	• Reduces demand in the corridor • **Reduces Single Occupant Vehicle (SOV) travel by less than 1%**	• Improves traveler access in corridor by supporting additional mode choice	• No physical impacts. • Reduction in emissions as a result of increased traffic flow.	**$0.5 million**

Figure 5.1 and Table 5.2 show the future afternoon peak hour level of service (LOS) results for SR 12 segments based on an estimated five percent reduction volume from the Project Group 1 improvements. Figure 5.1 shows the 2030 LOS results for the afternoon peak hour while Table 5.2 shows the afternoon peak hours analysis for 2010, 2015, and 2030.

Figure 5.1: 2030 Afternoon Peak Hour Level of Service with Project Group 1 Improvements

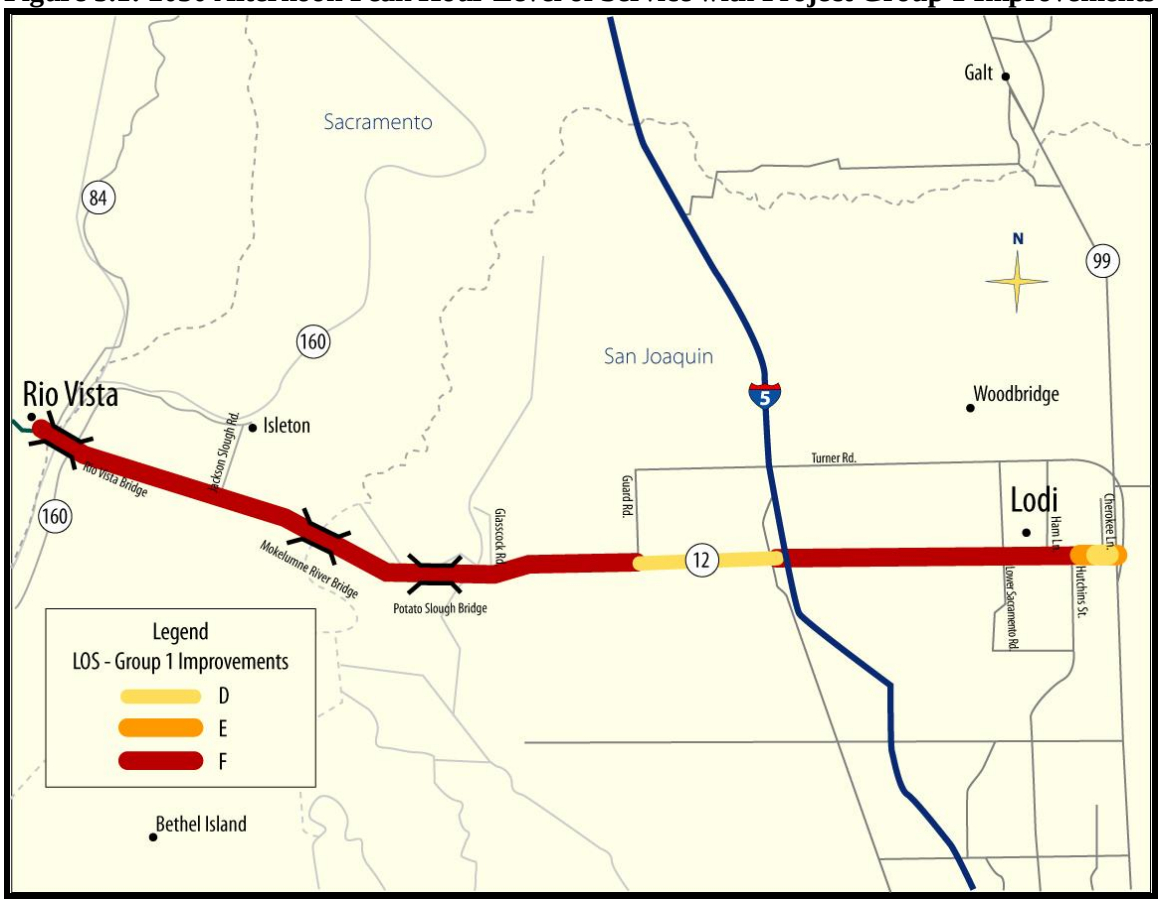


Table 5.2: 2005, 2010, 2015, and 2030 Afternoon Peak Hour Level of Service with Projects Group 1 Improvements

SR 12 Segment	2005	2010	2015	2030
Between Rte. 84 and Rte. 160 (Rio Vista Bridge)	C	D	D	F
East of Rte. 160	D	D	E	F
West of Terminous Road	D	D	E	F
East of Terminous Road	D	E	E	F
West of Tower Parkway	D	E	E	F
East of Tower Parkway	D	D	E	F
West of Guard Road	D	D	E	F
West of I-5 to Thornton Road	B	B	B	D
East of Thornton Road	C	D	D	F
West of Lower Sacramento Road	C	D	E	F
East of Lower Sacramento Road	D	E	F	F
West of South Ham Lane	D	E	E	F
East of South Ham Lane	D	E	E	F
West of South Hutchins Street	E	E	F	F
East of South Hutchins Street	E	E	E	F
West of Central Avenue	D	D	D	E
East of Central Avenue	D	D	D	D
West of Cherokee Lane	D	D	D	D
Between Cherokee Lane and South Jct. Rte. 99	C	D	D	F

This Project Group provides marginal LOS improvements throughout the corridor compared with the 2010, 2015, and 2030 results without any project improvements as shown in Section 2.0.

Based on discussions with FHWA, Caltrans and SJCOG, it is has been determined that these projects provide their own independent utility and can be programmed for future consideration either independently or collectively.

5.3 Project Group 2 Improvements

Project Group 2 improvements should be implemented after Project Group 1 improvements.

The total estimated cost for the twelve improvement alternatives in Project Group 2 is $130 million. Table 5.3 presents these improvements**,** including enhancing features, measures of improvement, environmental impacts, and planning-level costs.

Table 5.3: Project Group 2 Improvements

Project	Description and Features	Capacity Enhancing Features and Measure of Improvements	Other Features	Environmental Assessment (Impacts and Benefits)	Order of Magnitude Costs (Planning Level) 2005 Dollars
4. Widen SR 12 between east of Flag City Boulevard and Thornton Road	§ Widen roadway to 4 lanes from Thornton Road and the east of Flag City Boulevard. Signalize if warranted.	• Capacity enhancement • **Reduces segment only LOS from "D" to "C"**	• Safety enhancement considering trucks	• Potential impacts to wetlands. Potential impacts to endangered species. • Reduction in emissions as a result of increased traffic flow.	**$3.3 Million**
5. Widen SR 12 at Guard Road	§ Add acceleration and deceleration lanes on both sides of SR 12	• Reduces friction and traffic slow downs • Improves intersection LOS by one grade	• Reduces rear-end and head-on accidents	• Potential impacts to wetlands. Potential impacts to endangered species. • Reduction in emissions as a result of increased traffic flow.	**$2.4 Million**
6. Add Left Turn Lane at Peatland Road and SR 12	§ Add left turn lane on SR 12	• Reduces friction and traffic slow downs • Improves left turn LOS by one grade	• Reduces rear-end accidents	• Limited physical impacts. No impacts to wetlands. Area is developed in agriculture. • Reduction in emissions as a result of increased traffic flow.	**$0.4 Million**
7. Add Left Turn Lane at Correia Road and SR 12	§ Add left turn lane on SR 12	• Reduces friction and traffic slow downs • Improves left turn LOS by one grade	• Reduces rear-end accidents	• Limited physical impacts. No impacts to wetlands. • Reduction in emissions as a result of increased traffic flow.	**$0.4 Million**
8. Widen SR 12 at Jackson Slough Road	• Add acceleration and deceleration lanes on both sides. Signalize if warranted. (Pending new developments).	• Reduces friction and traffic slow downs • Improves intersection LOS by one grade	• Reduces rear-end and head-on accidents	• Potential impacts to wetlands. Potential impacts to endangered species. • Reduction in emissions as a result of increased traffic flow.	**$4.5 Million**

Table 5.3: Project Group 2 Improvements (Continued)

Project	Description and Features	Capacity Enhancing Features and Measure of Improvements	Other Features	Environmental Assessment (Impacts and Benefits)	Order of Magnitude Costs (Planning Level) 2005 Dollars
9. Realign Tower Park Way and Glasscock Road. Widen SR 12 to 4 lanes at the intersection.	• Realign roadway and widen intersection to 4 lanes on SR 12. Signalize if warranted. • **Alternate Configuration**: Construct button hook ramps.	• Reduces friction and traffic slow downs • Improves intersection LOS by one grade	• Reduces rear-end and head-on accidents	• Potential impacts to wetlands, endangered species, and cultural resources. Also, an area of unstable soils. • Reduction in emissions as a result of increased traffic flow.	**$16.8 Million**
10. Widen SR 12 at Terminous Road	• Add left turn lane on SR 12 • **Alternate Configuration**: Combine Brannan Road and Terminous Road into one intersection and signalize if warranted. Refer to Appendix B for public comment on recommended configuration.	• Reduces friction and traffic slow downs • Improves left turn LOS by one grade	• Reduces rear-end and head-on accidents	• Potential impacts to wetlands, endangered species, and cultural resources. Also, an area of unstable soils. • Reduction in emissions as a result of increased traffic flow.	**$0.4 Million**
11. Widen SR 160 at SR 12	• Widen SR 160 to 4 lanes and add right turn lanes at the intersection. (Pending new developments).	• Capacity enhancement • Improves intersection LOS by one grade	• Safety enhancement	• Potential impacts to wetlands. Potential impacts to endangered species. Potential impacts to cultural resources. • Reduction in emissions as a result of increased traffic flow.	**$0.7 Million**
12. Add Passing Lanes on SR 12 between Westgate Road and Flag City Boulevard	§ Add 12 foot passing lanes for each direction. Each passing lane approximately one mile, staggered, with one to two mile spacing between each passing lane. No median barriers.	• Reduces friction and traffic slow downs • **Reduces segment LOS from "D" to "C"**	• Reduces rear-end and head-on accidents	• Potential impacts to wetlands. Potential impacts to endangered species. • Reduction in emissions as a result of increased traffic flow.	**$13.3 Million**

Table 5.3: Project Group 2 Improvements (Continued)

Project	Description and Features	Capacity Enhancing Features and Measure of Improvements	Other Features	Environmental Assessment (Impacts and Benefits)	Order of Magnitude Costs (Planning Level) 2005 Dollars
13. Add Passing Lanes on SR 12 between I-5 and Potato Slough Bridge	§ Add 12 foot passing lanes for each direction. Each passing lane approximately one mile, staggered, with one to two mile spacing between each passing lane. No median barriers.	• Reduces friction and traffic slow downs • **Reduces segment LOS from "E" to "D"**	• Reduces rear-end and head-on accidents	• Potential impacts to wetlands. Potential impacts to endangered species. Also, an area of unstable soils. • Reduction in emissions as a result of increased traffic flow.	**$27.1 Million**
14. Add Passing Lanes on SR 12 between Potato Slough Bridge and Mokelumne River Bridge	§ Add 12 foot passing lanes for each direction. Each passing lane approximately one mile, staggered, with one to two mile spacing between each passing lane. No median barriers. § Add overlay on existing roadway to correct settlement.	• Reduces friction and traffic slow downs • **Reduces segment only LOS from "E-F" to "D"**	• Reduces rear-end and head-on accidents	• Potential impacts to wetlands. Potential impacts to endangered species. Also, an area of unstable soils. • Reduction in emissions as a result of increased traffic flow.	**$26.8 Million**
15. Add Passing Lanes on SR 12 between Mokelumne River Bridge and SR 160	• Add 12 foot passing lanes for each direction. Each passing lane approximately one mile, staggered, with one to two mile spacing between each passing lane. No median barriers. • Add overlay on existing roadway to correct settlement	• Reduces friction and traffic slow downs • **Reduces segment only LOS from "E-F" to "D"**	• Reduces rear-end and head-on collisions	• Potential impacts to wetlands, endangered species, and cultural resources. Also, an area of unstable soils. • Reduction in emissions as a result of increased traffic flow.	**$33.1 Million**
Expand Transit Service Operation (Continuous project)	Expand weekday service between Lodi and Rio Vista.	• Reduces demand in the corridor • **Reduces Single Occupant Vehicle (SOV) travel by less than 1%**	• Improves traveler access in corridor by supporting additional mode choice	• No physical impacts. • Reduction in emissions as a result of increased traffic flow.	**$0.5 million**

Figures 5.2 and Table 5.4 show the LOS on SR-12 highway segments if all Project Group 2 Improvements are completed.

Figure 5.2: 2030 Afternoon Peak Hour Level of Service with Project Group 2 Improvements

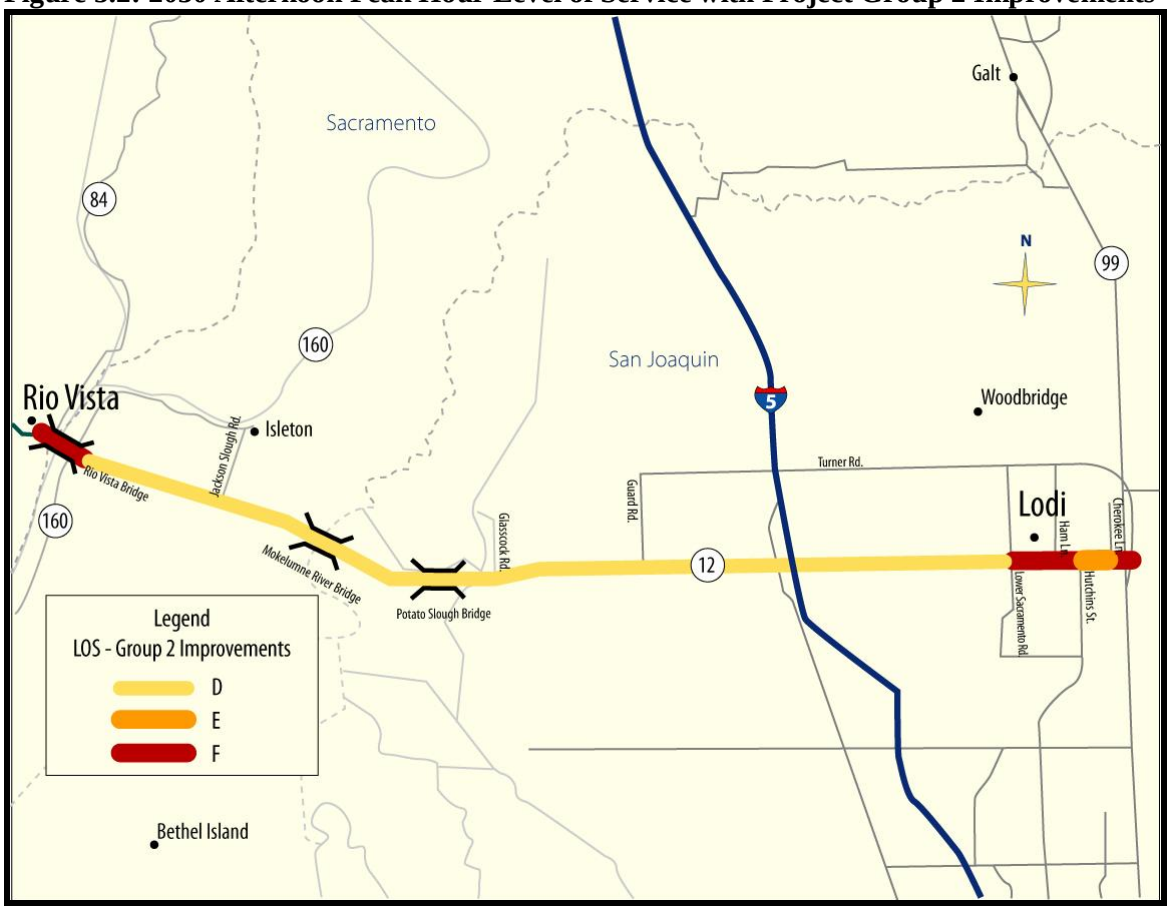


Table 5.4: 2005, 2010, 2015, and 2030 Afternoon peak Hour Level of Service with Project Group 2 Improvements

SR 12 Segment	2005	2010	2015	2030
Between Rte. 84 and Rte. 160 (Rio Vista Bridge)	C	D	E	F
East of Rte. 160	B	C	C	D
West of Terminous Road	B	C	C	D
East of Terminous Road	C	C	C	D
West of Tower Parkway	C	C	C	D
East of Tower Parkway	B	C	C	D
West of Guard Road	B	C	C	D
West of I-5 to Thornton Road	B	B	C	D
East of Thornton Road	B	B	B	D
West of Lower Sacramento Road	B	B	B	D
East of Lower Sacramento Road	D	E	F	F
West of South Ham Lane	D	E	F	F
East of South Ham Lane	D	E	F	F
West of South Hutchins Street	E	E	F	F
East of South Hutchins Street	E	E	F	F
West of Central Avenue	D	D	D	E
East of Central Avenue	D	D	D	E
West of Cherokee Lane	D	D	D	E
Between Cherokee Lane and South Jct. Rte. 99	D	D	E	F

With the exception of the Rio Vista Bridge, the rural segments of the passing lane package show improvements of up to 2 LOS grades in 2030. The rural segment LOS standards (defined by Caltrans to be LOS C for rural roadway segments) are expected to be met through 2015. However, all rural segments will be expected to be LOS D or worse by 2030, one LOS grade worse than the expected rural standard. Urban segments, which would not be widened from four to six lanes in this package, are not expected to meet the LOS standards in some segments in 2010 and 2015. No segments would meet LOS standards by 2030.

Based on discussions with FHWA, Caltrans and SJCOG, it is has been determined that these projects provide their own independent utility and can be programmed for future consideration either independently or collectively.

5.4 Project Group 3 Improvements

Many of the projects are in environmentally sensitive areas west of the Potato Slough Bridge that cause construction to be significantly more expensive due to soil conditions and environmental concerns. The total estimated cost for the six improvement alternatives in Project Group 3 is $245 million. Table 5.5 presents these improvements**,** including enhancing features, measures of improvement, environmental impacts, and planning-level costs.

Table 5.5: Project Group 3 Improvements

Project	Description	Capacity Enhancing Features and Measure of Improvements	Other Features	Environmental Assessment (Impacts and Benefits)	Order of Magnitude Costs (Planning Level) 2005 Dollars
16. Widen SR 12 to 6 lanes between Lower Sacramento Road and Cherokee Lane	§ Widen from 4 to 6 lanes. (Approx. 6 feet on each side. Keep existing bike lanes) § Modify signals as necessary. § Widen at UPRR Crossing.	• Capacity enhancement • **Reduces segment LOS from "E-F" to "B-C"**	• Safety enhancement	• Reduction in emissions as a result of increased traffic flow.	**$50.7 Million**
17. Widen SR 12 at SR 99 between Cherokee Lane to Beckman Road	§ Widen roadway and bridge overpass. Modify interchange and signals.	• Capacity enhancement • **Reduces segment LOS from "D" to "B"**		• Limited physical impacts. Area of potential construction is already developed. No impacts to wetlands are expected. • Reduction in emissions as a result of increased traffic flow.	**$30.0 Million** (Source: City of Lodi)
18. Widen SR 12 to 4 lanes between Lower Sacramento Road to Flag City Boulevard	• Widen to 4 lanes	• Capacity enhancement • **Reduces segment only LOS from "E-F" to "D"**	• Safety enhancement	• Potential impacts to wetlands. Potential impacts to endangered species. Potential impacts to cultural resources. • Reduction in emissions as a result of increased traffic flow.	**$10.5 Million**
19. Widen or replace Mokelumne River Bridge	• Widen to 4 lanes or replace bridge based on further feasibility studies	• Capacity enhancement • **Reduces segment only LOS from "F" to "C-D"**	• Safety enhancement • Maintenance reduction	• Potential impacts to wetlands. Potential impacts to endangered species. Potential impacts to cultural resources, and the bridge itself. Potential impacts to visual resources. • Reduction in emissions as a result of increased traffic flow.	**$33.2 Million**

Table 5.5: Project Group 3 Improvements (Continued)

Project	Description	Capacity Enhancing Features and Measure of Improvements	Other Features	Environmental Assessment (Impacts and Benefits)	Order of Magnitude Costs (Planning Level) 2005 Dollars
20. Widen Potato Slough Bridge	• Widen to 4 lanes or replace bridge based on further feasibility studies	• Capacity enhancement • **Reduces segment only LOS from "F" to "C-E"**	• Safety enhancement	• Potential impacts to wetlands. Potential impacts to endangered species. Potential impacts to cultural resources, and the bridge itself. Potential impacts to visual resources. • Reduction in emissions as a result of increased traffic flow.	**$25.2 Million**
21. Widen SR 12 to 4 lanes between Rio Vista Bridge and I-5	• Widen to 4 lanes with 4' concrete barrier. • **Alternate Configuration:** Construct a viaduct between Rio Vista Bridge and Potato Slough Bridge. Existing bridges can remain to serve the local traffic or removed. (Bridge removal costs not included). Widen to four lanes between I-5 and Potato Slough Bridge.	• Capacity enhancement • **Reduces segment only LOS from "F" to "C-D"** • **Viaduct – Reduces segment LOS from "F" to "B-C"**	• Safety enhancement	• Potential impacts to wetlands. Potential impacts to endangered species. Also, an area of unstable soils. • Reduction in emissions as a result of increased traffic flow.	**$95.1 Million** **Alternate:** **$603 Million** (Rio Vista Bridge excluded)
Expand Transit Service Operation (Continuous project)	§ Expand weekday service between Lodi and Rio Vista.	• Reduces demand in the corridor • **Reduces Single Occupant Vehicle (SOV) travel by less than 1%**	• Improves traveler access in corridor by supporting additional mode choice	• No physical impacts. • Reduction in emissions as a result of increased traffic flow.	**$0.5 million**

Figure 5.3 and Table 5.6 show the LOS for SR-12 with completion of all Project Group 3 improvements.

Figure 5.3: 2030 Afternoon Peak Hour Level of Service with Project Group 3 Improvements

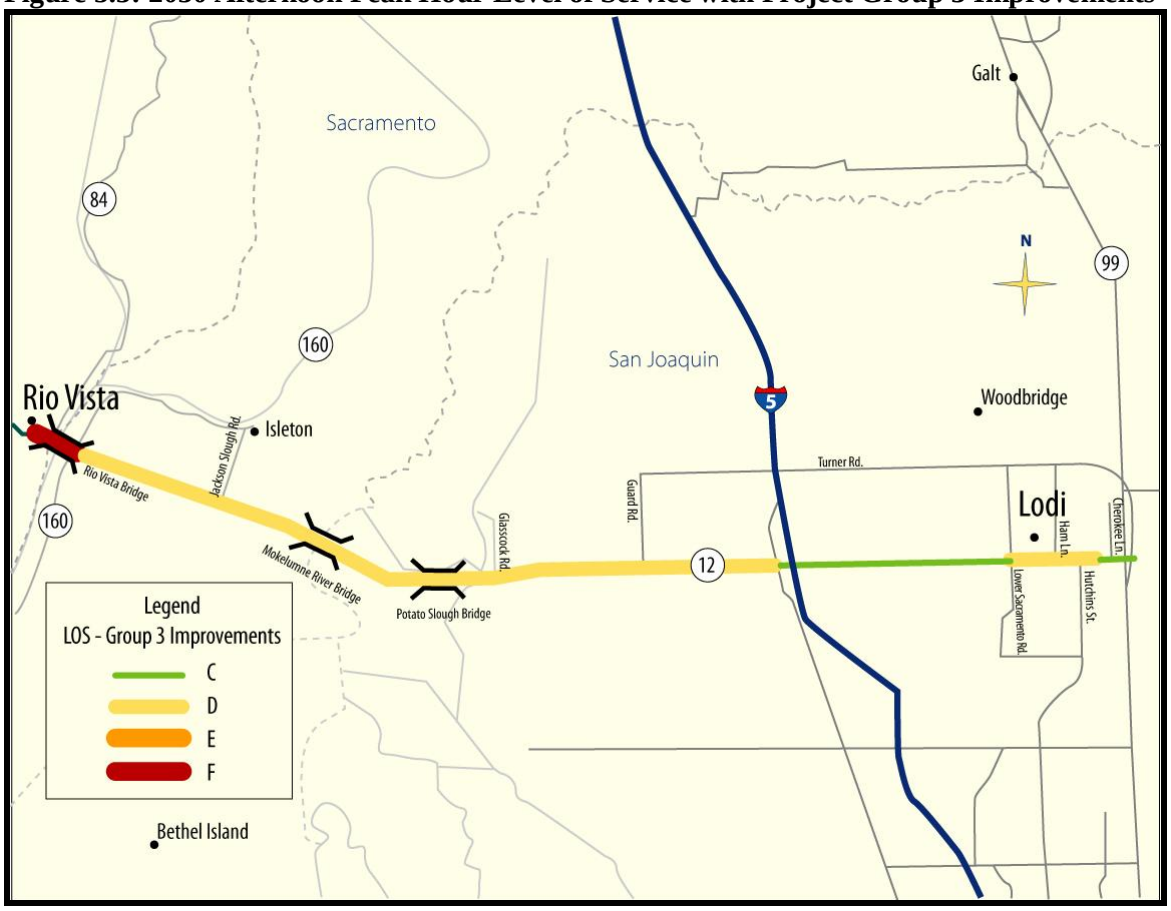


Table 5.6: 2005, 2010, 2015, and 2030 Afternoon Peak Hour Level of Service with Project Group 3 Improvements

SR 12 Segment	2005	2010	2015	2030
Between Rte. 84 and Rte. 160 (Rio Vista Bridge)	C	D	D	F
East of Rte. 160	B	C	C	D
West of Terminous Road	B	C	C	D
East of Terminous Road	C	C	C	D
West of Tower Parkway	C	C	C	D
East of Tower Parkway	B	C	C	D
West of Guard Road	B	C	C	D
West of I-5 to Thornton Road	B	B	B	C
East of Thornton Road	B	B	B	C
West of Lower Sacramento Road	B	B	B	C
East of Lower Sacramento Road	B	C	C	D
West of South Ham Lane	C	C	C	D
East of South Ham Lane	B	C	C	D
West of South Hutchins Street	C	C	C	D
East of South Hutchins Street	C	C	C	D
West of Central Avenue	B	B	B	C
East of Central Avenue	B	B	B	C
West of Cherokee Lane	B	B	B	C
Between Cherokee Lane and South Jct. Rte. 99	B	B	B	C

Compared to 2030 conditions without the implementation of any project improvements, the rural segments of the passing lane package show improvements of up to 2 LOS grades in 2030, with fewer failing segments.

This package operates better than Project Group 2 in 2015 because all urban and rural segments in the corridor are expected to meet established LOS standards. By 2030, the widening of the Mokelumne River and Potato Slough bridges will result in a LOS at the bridges that will be better than in Project Group 2. Rural segments by 2030 are expected to operate at LOS D, which is slightly worse than the LOS C standard.

Based on discussions with FHWA, Caltrans and SJCOG, it is has been determined that the limits for these projects will be dependent on a more detailed traffic analysis and the final layout of SR 12. These limits should be confirmed once the traffic analysis is completed. The traffic analysis should clearly state the usability of the independent projects, even if no additional transportation improvements in the area are made and that the decision doesn't restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

5.5 Project Group 4 Improvements

The widening or replacement of the Rio Vista Bridge is included alone under Project Group 4 due to its high estimated cost. According to a Caltrans study completed in October 1994, the total estimated cost for this project is $320 million (after adjusting for inflation to 2005).

Between the years 1992 and 1994, the following "Route 12 – Sacramento River Crossing at Rio Vista" reports summarized in Table 5.7 were prepared for the City of Rio Vista and Caltrans D-10.

Table 5.7: Completed Studies on the Sacramento River Crossing at Rio Vista

Report	Summary of Findings/Recommendations
Preliminary Site Selection Report	This report addressed the first phase of the Project Study Report prepared by Caltrans in August 1992 for SR 12 between Azevedo Road and the Sacramento River Bridge. It identified and examined eight alternatives and selected Alternative 2 (parallel) and Alternative 6 (southern) as the two favorable ones. Alternative 2 coincides with the existing SR 12 and is a mid-level lift bridge that passes most of maritime traffic without lifting. It would be higher than existing bridge but not high enough to pass all boats. Alternative 6 is a bypass south of Rio Vista and includes a high-level, non-lift bridge. Both alternatives can be phased.
Rio Vista High Bridge Study	This concludes that ultimately SR 12 will need to be a freeway. It states that the forecasted traffic volumes entering and leaving the City of Rio Vista necessitate four-lanes along SR 12.
Funding Evaluation - Rio Vista Bridge Project	This identified potential funding sources (federal, state and local) for the favorable project alternatives. However, it concludes that the chances of obtaining funding from these "traditional" sources are slim. It recommends seeking "non-traditional" funding sources, such as toll, privatization, sales taxes and developer impact fees.
Preliminary Geotechnical Engineering Review	This was a planning-level review of geotechnical issues related to bridge and roadway construction.
Project Feasibility Report	This analyzed the two alternatives with respect to capacity, right-of-way acquisition, and cost. The total cost estimates were $210M for Alternative 2 and $207M for Alternative 6.
Preliminary Environmental Analysis Report	The proposed project would likely require a jointly-prepared EIR/EIS, which needs between 30 and 42 months to complete. Potential issues exist with the following resources: air quality, archaeological, architectural, biological, floodplain, hazardous waste/material, noise, socioeconomic, visual and water quality.

Based on discussions with FHWA, Caltrans and SJCOG, it is has been determined that the limits for the Rio Vista Bridge will be dependent on a more detailed traffic analysis and the final layout of SR 12. These limits should be confirmed once the traffic analysis is completed. The traffic analysis should clearly state the usability of the independent projects, even if no additional transportation improvements in the area are made and that the decision doesn't restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

Table 5.8 presents project improvements**,** including enhancing features, measures of improvement, environmental impacts, and planning-level costs.

Table 5.8: Project Group 4 Improvements

Project	Description	Capacity Enhancing Features and Measure of Improvements	Other Features	Environmental Assessment (Impacts and Benefits)	Order of Magnitude Costs (Planning Level) 2005 Dollars
22. Widen, replace, or realign Rio Vista Bridge	• Widen to 4 lanes or replace bridge based on feasibility studies	• Capacity enhancement • **Reduces segment LOS from "F" to "D"**	• Safety enhancement • Maintenance reduction	• Potential impacts to wetlands. Potential impacts to endangered species. Potential impacts to cultural resources, and the bridge itself. Potential impacts to visual resources. • Reduction in emissions as a result of increased traffic flow.	**$320 Million** Source: Caltrans Oct 1994 Study (Adjusted to 2005 dollars)

Figure 5.4 and Table 5.9 present LOS results with Project Group 4 improvements.

Figure 5.4: 2030 Afternoon peak Hour Level of Service with Project Group 4

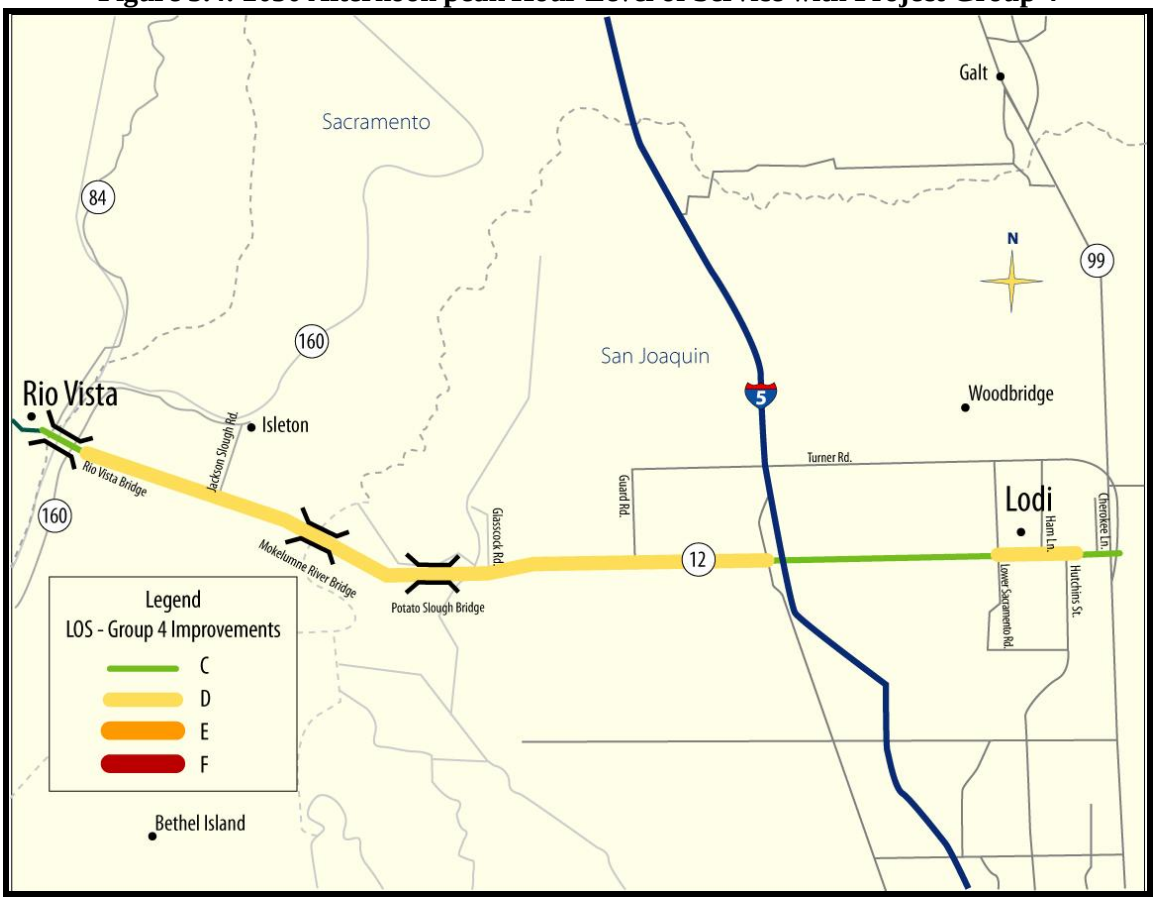


Table 5.9: 2005, 2010, 2015, and 2030 Afternoon Peak Hour Level of Service with Project Group 4 Improvements

SR 12 Segment	2005	2010	2015	2030
Between Rte. 84 and Rte. 160 (Rio Vista Bridge)	B	B	B	C
East of Rte. 160	B	C	C	D
West of Terminous Road	B	C	C	D
East of Terminous Road	C	C	C	D
West of Tower Parkway	C	C	C	D
East of Tower Parkway	B	C	C	D
West of Guard Road	B	C	C	D
West of I-5 to Thornton Road	B	B	B	C
East of Thornton Road	B	B	B	C
West of Lower Sacramento Road	B	B	B	C
East of Lower Sacramento Road	B	C	C	D
West of South Ham Lane	C	C	C	D
East of South Ham Lane	B	C	C	D
West of South Hutchins Street	C	C	C	D
East of South Hutchins Street	C	C	C	D
West of Central Avenue	B	B	B	C
East of Central Avenue	B	B	B	C
West of Cherokee Lane	B	B	B	C
Between Cherokee Lane and South Jct. Rte. 99	B	B	B	C

LOS results for Project Group 4 are similar to that of Project Group 3. In this fourth group of improvements, the widened Rio Vista Bridge operates at a better LOS than the non-widened bridge in the third project group.

Figure 5.5 summarizes the projected roadway LOS for each segment of SR 12 at the following milestone years:

- Year 2005 – Existing LOS
- Year 2010 – LOS with Project Groups 1 and 2 implemented
- Year 2015 – LOS with Project Groups 1, 2, and 3 implemented
- Year 2030 – LOS with Project Groups 1, 2, 3, and 4 implemented

STATE ROUTE (SR 12) COMPREHENSIVE TRANSPORTATION CORRIDOR STUDY

(Rio Vista Bridge to SR 99)

DISCTRICT 10
Transportation Planning / Traffic Operations
2/27/06

Segment	A	B	C	D	E
Location	Rio Vista Bridge	Rio Vista Bridge to Mokelumne River Bridge	Mokelumne River Bridge to Potato Slough Bridge	Potato Slough Bridge to I-5	I-5 to SR-99
Post Mile Limits	26.23 – 26.40	0.00 – 6.00	0.00 – 4.99	4.99 – 10.16	10.16 – 18.01
Existing Lanes (2005)	2	2	2	2/4	2/4
Base Year LOS	C	D	D	E/B	C/D/E/D

Major Programmed Highway Projects (Project Group 1)

1. Implement Motorist Information and Incident Management System
2. Expand Transit Service Operation.
3. Construct Park and Ride Facilities.

Major Programmed Highway Projects (Project Group 2)

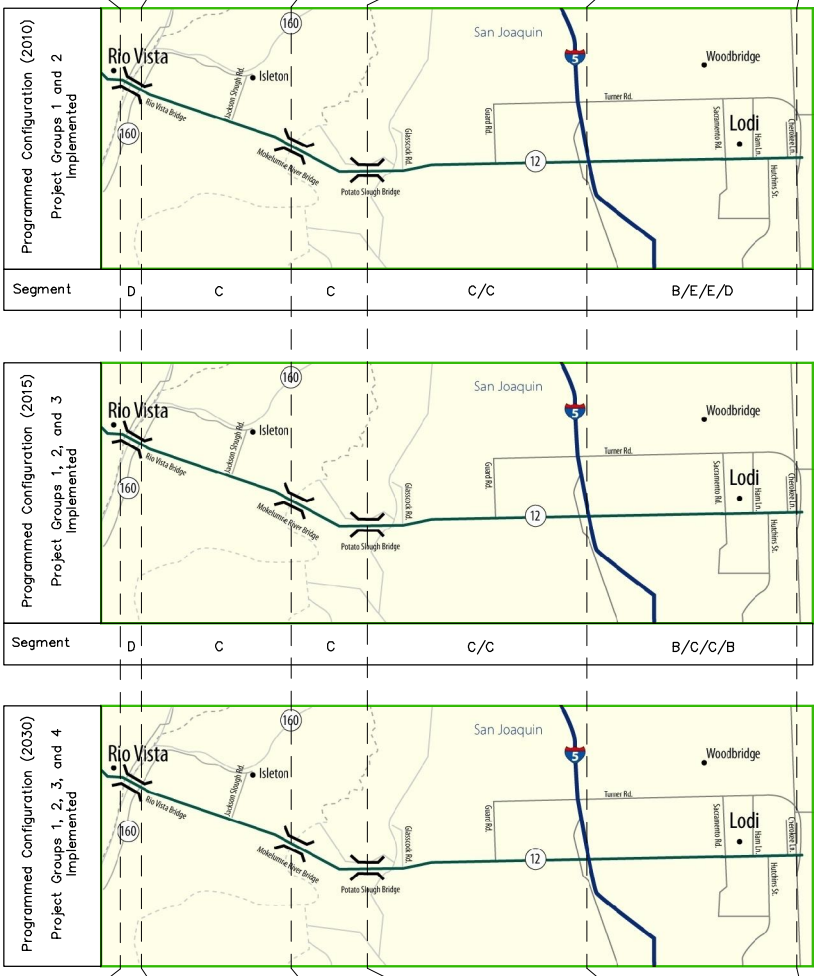
4. Widen SR 12 between East of Flag City Blvd and Thornton Rd.
5. Widen SR 12 at Guard Rd.
6. Add Left Turn Lane at Peatland Rd and SR 12.
7. Add Left Turn Lane at Correia Rd and SR 12.
8. Widen SR 12 at Jackson Slough Rd.
9. Realign Tower Park Way and Glasscock Rd. Widen SR 12 to 4 Lanes at Intersection.
10. Widen SR 12 at Terminous Rd.
11. Widen SR 160 at SR 12.
12. Add Passing Lanes on SR 12 between Westgate Rd and Flag City Blvd.
13. Add Passing Lanes on SR 12 between I-5 and Potato Slough Bridge.
14. Add Passing Lanes on SR 12 between Potato Slough Bridge and Mokelumne River Bridge.
15. Add Passing Lanes on SR 12 between Mokelumne River Bridge and SR 160.

Major Programmed Highway Projects (Project Group 3)

16. Widen SR 12 to 6 Lanes between Lower Sacramento Rd and Cherokee Ln.
17. Widen SR 12 to 6 Lanes at SR 99 between Cherokee Ln. and Beckman Rd.
18. Widen SR 12 to 4 Lanes between Lower Sacramento Rd and Flag City Blvd.
19. Widen or Replace Mokelumne River Bridge.
20. Widen Potato Slough Bridge.
21. Widen SR 12 to 4 Lanes between Rio Vista Bridge and I-5.

Major Programmed Highway Projects (Project Group 4)

22. Widen, Replace, or Realign Rio Vista Bridge.



	C	D	D	D/D	C/D/D/C
Highway Operational Concept Configuration (2030)	4	4	4	4	4/6
% ADT Growth Forecast	120%	50%	50%	120%/120%	80%/50%/80%/50%

FIGURE 5.5

SR 12 COMPREHENSIVE TRANSPORTATION CORRIDOR STUDY
(Rio Vista Bridge to SR 99)
Summary of Proposed Projects

Kinley-Horn and Associates, Inc.

6 NEXT STEPS AND RECOMMENDATIONS

6.1 Logical Termini and Independent Utility

In discussions with the FHWA, the improvement projects recommended in this study satisfy the FHWA requirements for planning roadway improvement projects and meet the definitions of Logical Termini and Independent Utility as described below for each group of projects:

1) **Group 1 Projects - Transportation Systems Management and Transportation Demand Management (TSM/TDM):**

   a) Implementation of Motorist Information and Incident Management System (Project No. 1);

   b) Construction of Park and Ride Facilities (Project No. 2); and

   c) Expansion of Transit Service operation (Project No. 3).

Group 1 projects provide their own independent utility and can be programmed for future consideration. It is recommended that Caltrans proceed with the Project Initiation Documents (PID)/Project Study Report/Project Report (PSR/PR) and Environmental Document (ED) approval, either independently for each project or combined as one project.

2) **Group 2 Projects - Widening of SR 12 to 3 lanes (Passing Lanes):**

   a) Passing Lanes between Westgate Road and Flag City Boulevard (Project No. 12), including widening of SR 12 between east of Flag City Boulevard and Thornton Road (Project No. 4);

   b) Passing Lanes between I-5 and Potato Slough Bridge (Project No. 13), including widening of SR 12 at Guard Road (Project No. 5); adding left turn Lane at Peatland Road (Project No. 6); adding left-turn lane at Correia Road (Project No. 7), and realigning Tower Park Way and Glasscock Road and widening of SR 12 to 4 lanes at the intersection (Project No. 9).

   c) Passing Lanes between and Potato Slough Bridge and Mokelumne River Bridge (Project No. 14).

   d) Passing Lanes between Mokelumne River Bridge and SR 160 (Project No. 15), including widening of SR 12 at Jackson Slough Road (Project No. 8); widening of SR 12 at Terminous Road (Project No. 10); and widening of SR 160 at SR 12 (Project No. 11).

Group 2 projects, including the localized operational improvement projects, are independent projects having their own utility and can be programmed for future consideration. It is recommended that Caltrans should proceed with the PID/PSR/PR and ED, either independently for each project or combined as one project. The passing lanes will be staggered and be transitioned to 2-lanes prior to the existing bridges.

3) Group 3 Projects - Widening of SR 12 to 4 to 6 lanes between SR 99 and SR 160:

Between SR 99 and Westgate Road:

a) Widening of SR 12 to 6 lanes between Lower Sacramento Road and Cherokee Lane (Project No. 16); and

b) Widening of SR 12 to 6 lanes between Cherokee Lane and Beckman Road, including SR 99 upgrades (Project No. 17).

Between Westgate Road/Lower Sacramento Road and I-5:

c) Widening of SR 12 to 4 lanes between Lower Sacramento Road and Flag City Boulevard (Project No. 18).

Between I-5 and SR 160:

d) Widening or replacement of Mokelumne River Bridge (Project No. 19);

e) Widening or replacement of Potato Slough Bridge (Project No. 20); and

f) Widening of SR 12 to 4 lanes between I-5 and SR 160 (Project No. 21).

Group 3 projects will be dependent on a more detailed traffic analysis and the final layout of SR 12. These limits should be confirmed once the traffic analysis is completed. The traffic analysis should clearly state the usability of the independent projects, even if no additional transportation improvements in the area are made and that the decision doesn't restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

4) **Group 4 Project - Widening or replacement of Rio Vista Bridge (Project No. 22):**

   The limits for the Rio Vista Bridge project will be dependent on a more detailed traffic and structural analysis. Solano County Transportation Authority is planning to conduct a more detailed traffic and structural analysis to confirm the independent utility of the project.

Caltrans can utilize this corridor study to proceed with the Project Initiation Document (Project Study Report/Project Report and Environmental Document), based on priorities established by the regional partners and funding availability for the corridor. Caltrans may wish to proceed with the PID for selected projects, such as one of the Passing Lane projects or Intelligent Transportation Systems (ITS) project initially.

6.2 Funding Options

Funding options for SR 12 improvements projects will include a variety of options, including State Transportation Improvement Program (STIP), Local Measure K funds, federal funding through the Safe, Accountable, Flexible and Efficient Transportation Equity Act – a Legacy for Users (SAFETEA-LU), public-private financing, and Toll roads.

Toll roads can help meet highway demands by supplementing existing sources of federal, state, and local highway funds with private capital. In doing so, they enable state and local governments to build new capacity sooner than they otherwise would be able. Obtaining financing from private investors and lenders is a key element in the toll roads. A blend of public and private investment and sponsorship is instrumental in providing more highway capacity with fewer public funds.

Toll roads can also help allocate resources efficiently. For example, if tolls were set in a way that reflected the cost of congestion, they could decrease traffic delays for motorists whose value of time is high and who are willing to pay, while other traffic would remain on toll-free – but more congested – roads. Toll roads also improve efficiency in investment. To attract private capital, they must meet the market test of offering a competitive rate of return. That test reduces the chances of building uneconomic roads.

The most promising candidates for toll roads will include the 4- to 6-lane widening options, Rio Vista Bridge, or new viaduct or tunnel option for SR 12. Moreover, because those roads are new, motorists have the alternative of taking the toll-free routes that they used before the new roads were built.

Efforts to build toll roads are affected by past and present federal policies. From 1916 to the late 1980s, because toll roads were considered an impediment to interstate commerce, federal policies discouraged states from building them or imposing tolls on existing

roads. As a result, the nation has relatively little experience with toll facilities. But fiscal constraints at all levels of government (and advances in the technology of toll-taking) have generated renewed interest in toll roads and led to more liberal federal policies as a result of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the National Highway System Designation Act of 1995 (the NHS act), and the new SAFETEA-LU. Some of the new toll roads take advantage of indirect federal aid in the form of tax-exempt financing. An example of a Toll Road in California is State Route 91 in Orange County.

APPENDIX A:

November 17, 2005 Public Outreach Meeting Minutes

SR-12 Corridor Study (Rio Vista Bridge to SR-99)
Public Meeting
Minutes of the Meeting
November 17, 2005

Goals of Meeting:

- Overview of Project
- Questions and Answers
- General Discussion and Input on Priorities
- Conclusions

Topics of Discussion and Comments:

- Kome Ajise, Caltrans District 10 Director, gave an introduction to the project
- Anush Nejad, Kimley-Horn and Associates, facilitated the presentation and discussion. He presented the project needs and goals.
    - Purpose was to conduct a comprehensive corridor study for SR 12 from west of Rio Vista Bridge to SR 99.
    - Project goals included review of alternative transportation improvements to address capacity and operational issues in the corridor.
    - This project is a partnership between Caltrans Districts 3 and 4, and 10; Cities of Lodi, Rio Vista, and Isleton; Counties of Sacramento, Solano and San Joaquin; Solano TA, San Joaquin COG; FHWA and transit agencies.
- The project steps are as follows:
    - This project is an early planning effort to address issues along SR 12 and to develop a course of action.
    - The consultant team met on a monthly basis with stakeholders to review project issues.
    - The team analyzed existing conditions to gain a better understanding of the issues.
    - Analyzed future conditions to understand capacity and operational issues for 2010, 2015 and 2030.
    - Developed potential projects for consideration.
- Existing issues were discussed:
    - The study area is traditionally agricultural-based with recent urban development.
    - High SR-12 traffic volume is generated by regional through trips, goods movement, intercity travel, commute traffic, agricultural truck trips, and recreational travel.
    - Current Average Daily Traffic volume is around 22,000 to 33,000. ADT is expected to reach 36,000 to 52,000 in 2030.
    - Current Truck Traffic is between 9 to 15%.

- Capacity: fast growth, slower vehicles, high truck volumes, drawbridges, inability to divert around accidents, no viable alternative routes.
- Safety: crossing agricultural vehicles.
- Geotechnical: highly-compressive peat and clay, differential settlement causes expensive maintenance and repairs.
- Environmental: sensitive habitats, fog, and peat dust.

- Level of Service (LOS) was defined. Existing and future SR 12 LOS were presented. During the AM peak period, unacceptable LOS E or F are forecasted by 2015. During the PM peak period, much of the corridor sections will be LOS E or F by 2010, with nearly all sections at LOS E or F for 2015 and 2030. This analysis does not consider the effects of bridge delays.
- Types of project alternatives were presented:
  - Traveler & Motorist Information Systems – Intelligent Transportation Systems (ITS), include dynamic message signs, CCTV cameras for monitoring traffic conditions.
  - Operational Enhancements – localized modifications to intersections, including auxiliary left- and right-turn lanes, and passing lanes.
  - Capacity Enhancements – road widening, bridge replacement/widening, and elevated structures (viaducts).
- Project alternatives were presented along with their recommended order of completion. The sequence generally starts from less intrusive and less expensive projects to more expensive. Projects can be built successively as to not interfere with future projects. In summary, they are as follows:
  - Implement Transportation Systems Management and Transportation Demand Management (TSM/TDM) Measure.
  - Widen SR 12 to 3 lanes (Passing Lanes), plus localized Intersection Operations Improvements between Westgate and Rio Vista Bridge.
  - Widen SR 12 to 6 lanes between SR 99 and Westgate to 4 lanes between Westgate and Rio Vista Bridge, including Widening of Potato Slough and Mokelumne Bridges.
  - Widen or Replace Rio Vista Bridge.
- *Question: What is the cost of improving SR 12 between SR 160 and I-5? What is the cost of a parallel road?* The cost of each project alternative in that area would needed to be added together. A new grade-separated roadway (viaduct) would cost $700 million. It would be safer, but it would cost more than the sum of all other project alternatives.
- *Comment:* Brannan Isle Road has much more traffic than Terminous Road. Because it is the main road in the area, safety improvements should be focused there. An acceleration lane at Jackson Slough Road would be helpful.
- *Question: Will drivers be able to see traffic signals in the fog, especially coming over a bridge?* Flashing devices will be needed in advance of a signal, especially before a large grade. Fog issues need to be studied. A grade-separated option would cost $15-$20 million.
- *Question: What happened to the eastbound acceleration lane at Tower Park Way? Why wasn't access to the Potato Slough Bridge addressed? A flashing yellow light is needed.* One

of the project alternatives proposes additional turning lanes, acceleration lanes, and button-hook ramps at this location.

- *Question: Can widening of SR 12 to 4 lanes west of I-5 be the priority? Are the smaller projects necessary?* The Federal Highway Administration (FHWA) requires logical termini for widening projects; therefore, 2-lane bridges can not be left between 4-lane sections of roadway.
- *Comment:* Passing lanes decrease safety because impatient drivers make dangerous passing maneuvers. Passing should be prohibited along the entire route. A median barrier would ensure this.
- *Comment:* In lieu of a solid median barrier, a low median marker might be a solution to reduce the number of dangerous passing maneuvers.
- *Comment:* Many trucks use this route to carry heavy loads because no truck scales are present. Scales should be added on the west side of the corridor.
- *Comment:* A signal at Jackson Slough Road would be difficult to see due to the geometry and speeders coming off the bridge.
- *Question: How would lanes be added to SR 12 in Lodi with so little room?* Widening is already part of Lodi's General Plan, but more impact analysis would be needed before it happens.
- *Question: Can the Rio Vista Bridge be widened? Is widening less expensive than replacing?* Due to the age of the bridges, widening is probably not feasible, so it would likely need to be replaced. Caltrans has studied alternate alignments.
- *Comment:* The forecasted growth seems underestimated given the new development planned in the next few years.
- *Comment: It makes more sense to build SR 12 to 4-lanes right now with today's dollars rather than constructing smaller projects.* The County receives an average of $24 million annually for road repairs and construction. Due to the large cost of widening the entire SR 12 corridor, smaller project alternatives are likely necessary.
- *Question: What is the feasibility of a toll road?* In California, toll roads are privately funded by collaborations of investors. For SR 12 to get a toll road, investors would have to approach Caltrans with a plan. This unlikely due to the relatively low traffic volumes.
- *Question: Have safety plans been considered? School buses are making u-turns on SR 12 near the Potato Slough Bridge.* Many safety issues are a result of poor decisions by drivers. More enforcement would help improve safety.
- *Question: Will the study address soil conditions? What will be vibration effects?* Vibration, air quality, and noise are all required to be studied in the environmental analysis.
- *Comment:* Soil conditions make passing lanes unsafe when the pavement begins to settle.
- *Comment:* Shoulders are not provided between the Potato Slough Bridge and SR 160. Drivers do not have room in the event of emergencies. Shoulders should be added to the entire corridor. The road widening projects would recommend 8 foot right side shoulders and 4 foot left side shoulders.
- *Comment*: More warning lights and stop lights should be added to help turning onto SR 12. Acceleration lanes should be added at more intersections.

- *Comment*: A traffic signal should be considered at the intersection of SR 12/Davis Road. There was yet another accident there a couple of weeks ago. Traffic on Davis has become quite heavy the last few years.
- *Comment:* Stakeholders should report periodically to the SR 12 Association Meeting.
- According to the public's input, the project goals and priorities should be the following:
    - Safety is the primary goal and should not be sacrificed for higher speed on SR 12.
    - Passing lanes may decrease safety by encouraging dangerous maneuvers.
    - A median barrier would be an effective way to increase safety.
    - Localized improvements are needed now to address safety problems.
    - Widening SR 12 sooner than later would save money and address the corridor's problems.
- All comments will be incorporated into the report and given to Caltrans for consideration.
- A draft report is expected in December or January.

APPENDIX B:

Public Comments for
Recommended SR 12
Configuration at Terminous Road

December 23, 2005

Kome Ajise, Director
Cal Trans District 10
1976 East Charter Way
Stockton, CA 95205

Dear Director Ajise:
I appreciate having had the opportunity to have been invited to the November 17, 2005 meeting on the SR-12 corridor study and to have met you. It's very important for many of us to realize that some needed focus is being placed on this very busy highway so that numerous safety issues can be better addressed.

In this letter I wish to further comment on the intersections of Jackson Slough, Terminous Road and Brannan Island Road with highway 12. As a marina and restaurant owner and as the founder of the Delta Loop Recreation Association I have had the opportunity to discuss local highway 12 problems with literally thousands of people over the years. Hopefully, such collective "wisdom" will be of value to you.

1) Jackson Slough/Highway 12 Intersection

Acceleration and deceleration lanes on highway 12 on both sides of the intersection should be both longer and wider. Many recreational vehicles on 12 that turn off onto Jackson Slough have a tough time slowing down adequately to turn onto the loop or to speed up if they wish to head east. Speeds of 60 to 70 mph are common on 12. Yes, a stoplight could be placed at this intersection, but if limited funds are available for stop lights, why here? Residents of Isleton who wish to travel to the west to Rio Vista could use 160 through their town because of safety and distance considerations. If they wish to travel east to Lodi or Stockton, a light as shown on the accompanying drawing would also be better for the same reasons. Finally, considering the Delta Loop to the south of highway 12, the largest number of R.V's, boat trailers, and recreationists in general are much closer to the Terminous/Brannan/12 area than the Jackson Slough/12 intersection.

2) Terminous Rd./Brannan Island Rd./Highway 12 Intersection Area

Before listing suggested improvements for this area several matters need to be noted. They include:

A) Brannan Island Road is the main and only street of the Delta Loop Recreational area;
B) Some 1500 large boats (30-80' in length), found in over a dozen marinas, serve as "floating cabins" in a sense where hundreds to thousands of people can be found throughout much of the year;
C) On the land side of Brannan Island Road several RV parks exist with perhaps 100 RVs or pickup-towed house trailers per park per day coming and going;
D) About 500 trailerable boats are present in Loop dry storage facilities

E) Cabins are rented along the loop and guests commonly bring with them trailerable boats; and
F) Restaurants and gift shops bring in the hundreds of visitors per day throughout much of the year.

Summary: The Delta Loop Recreation Area is like a town with thousands of people living in or using its facilities daily during much of the year. Additionally, the area has a high percentage of slow moving vehicles and its not uncommon to wait behind one trying to get onto highway 12 at the 12/Brannan Island Road intersection for 10 +/- minutes.

The accompanying sketch attempts to address the major problems of this area, realizing that the location of Georgianna Slough, the Mokelumne River and the Mokelumne River bridge strongly control what can be done.

Suggested changes include:

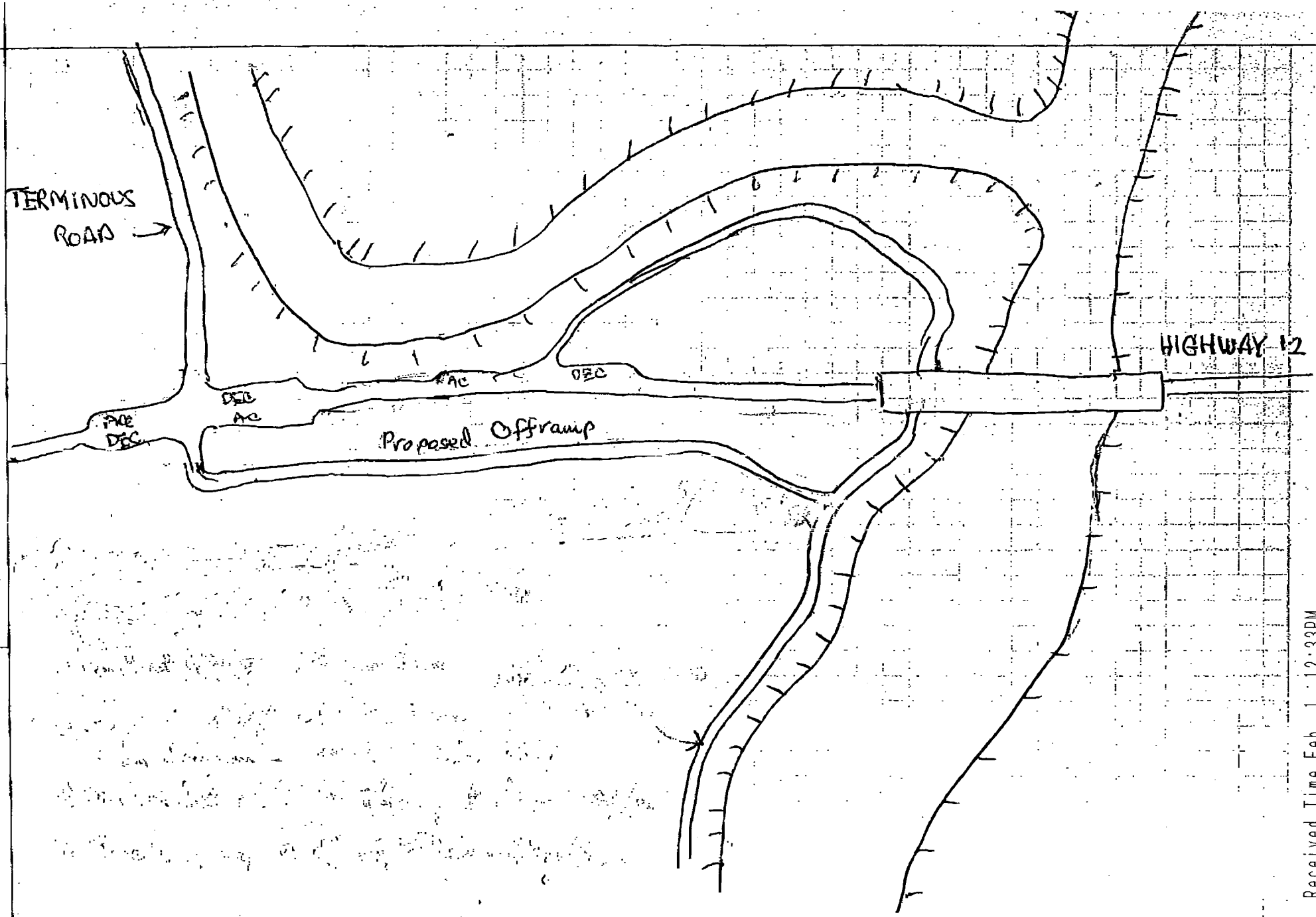
i) Install a stop light at the Terminous Rd/12 intersection thereby providing a way for the traffic from the Isleton area to safely gain access to eastbound, highway 12 lane;
ii) At the same location create a westbound acceleration lane so that any westbound traffic at the new stoplight need not cause the stoplight to stop traffic;
iii) Construct a short access or frontage road from Brannan Island Road to the same stoplight so that those from the Loop wanting to travel east on 12 can more easily gain access. With the addition of an eastbound acceleration lane from the stop light traffic could merge onto 12, thereby not needing to trigger the stoplight, and they could do so safely because of the increased distance to the bridge;
iv) Construct an eastbound deceleration lane from 12 to the new Brannan Island Road access;
v) Build a ramp from the new access road to Brannan Island Road and place a stop sign at the intersection;
vi) Place a 'No Left Turns' sign at the present intersection of Brannan Island Road and 12; and
vii) Construct a better acceleration lane at the same intersection.

We would certainly appreciate any help you can provide in making this proposal become a reality.

Sincerely,

Ken Scheidegger

Cc: Isleton Chamber of Commerce
Isleton City Council
Delta Loop Recreation Association



APPENDIX C:

Worksheets for Estimates of Probable Costs for Proposed Projects

SR 12 Corridor Study
Project No. 1
Motorist Information and Management System

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (5%)	LS	1	$ 181,913	$ 181,913
2	Traffic Control (5%)	LS	1	$ 173,250	$ 173,250
3	CMS (I-5 and SR-99)	EA	8	$ 100,000	$ 800,000
4	Small CMS (SR 12)	EA	4	$ 80,000	$ 320,000
5	Weather Stations	EA	2	$ 50,000	$ 100,000
6	CCTV	EA	8	$ 100,000	$ 800,000
7	HAR	EA	3	$ 80,000	$ 240,000
8	EMS	EA	8	$ 50,000	$ 400,000
9	Bridge Detection System	EA	3	$ 80,000	$ 240,000
10	RTMS	EA	10	$ 25,000	$ 250,000
11	Communications and Power	LS	1	$ 315,000	$ 315,000
12	Workstations	EA	3	$ 100,000	$ 300,000
13	Integration & Software	LS	1	$ 1,000,000	$ 1,000,000
Sub-Total					$ 5,120,163
14	Contingency at 25%				$ 1,280,041
15	Engineering and Construction Admin at 25%				$ 1,600,051
TOTAL					$ 8,000,254

Communication is based on wireless or leased lines
Power may be based on solar system, depending on location and distance to service point

SR 12 Corridor Study
Project No. 2
Park and Ride Lots

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (5%)	LS	1	$ 51,818	$ 51,818
2	Traffic Control (5%)	LS	1	$ 49,350	$ 49,350
3	Clear and Grub	EA	2	$ 20,000	$ 40,000
4	Excavation	CY	5600	$ 35	$ 196,000
5	Aggregate Base	Ton	7000	$ 25	$ 175,000
6	Asphalt Concrete	Ton	3750	$ 100	$ 375,000
7	Asphalt Berm	LF	1400	$ 25	$ 35,000
8	Drainage Inlet	EA	8	$ 5,000	$ 40,000
9	RCP	LF	200	$ 80	$ 16,000
10	Drainage Outlet	EA	2	$ 5,000	$ 10,000
11	Erosion Control and SWPPP	LS	1	$ 50,000	$ 50,000
12	Striping and Signing	EA	2	$ 25,000	$ 50,000
Sub-Total					$ 1,088,168
13	Contingency at 25%				$ 272,042
14	Engineering and Construction Admin at 25%				$ 340,052
15	Right of Way	SF	100000	$ 5	$ 500,000
TOTAL					$ 2,200,262

Assuming 2 lots. Each 50,000 SF
Assuming 6" AC; 12" AB/ASB

SR 12 Corridor Study
Project No. 4
Widen SR 12 between Thornton Road and East of Flag City Boulevard

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (5%)	LS	1	$ 77,438	$ 77,438
2	Traffic Control (5%)	LS	1	$ 73,750	$ 73,750
3	Clear and Grub	LS	1	$ 15,000	$ 15,000
4	Excavation	CY	5600	$ 25	$ 140,000
5	Aggregate Base	Ton	5000	$ 25	$ 125,000
6	Asphalt Concrete	Ton	6000	$ 100	$ 600,000
7	Asphalt Berm	LF	5000	$ 15	$ 75,000
8	Drainage Inlet	EA	4	$ 5,000	$ 20,000
9	RCP	LF	2500	$ 80	$ 200,000
10	Erosion Control and SWPPP	LS	1	$ 50,000	$ 50,000
11	Traffic Signal and Lighting	LS	1	$ 200,000	$ 200,000
12	Striping and Signing	LS	1	$ 50,000	$ 50,000
Sub-Total					$ 1,626,188
13	Contingency at 25%				$ 406,547
14	Engineering and Construction Admin at 25%				$ 508,184
15	Right of Way	SF	100000	$ 8	$ 800,000
TOTAL					$ 3,340,918

Assuming 2500 feet widening (Length); 40 feet (width).
Assuming 8" AC; 10" AB/ASB

SR 12 Corridor Study
Project No. 5
Widen SR 12 at Guard Road

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (5%)	LS	1	$ 74,406	$ 74,406
2	Traffic Control (5%)	LS	1	$ 70,863	$ 70,863
3	Clear and Grub	LS	1	$ 15,000	$ 15,000
4	Excavation	CY	1200	$ 25	$ 30,000
5	Saw Cut	LF	2000	$ 5	$ 10,000
6	Import Fill	CY	7500	$ 15	$ 112,500
7	Aggregate Base	Ton	9400	$ 25	$ 235,000
8	Asphalt Concrete	Ton	4000	$ 80	$ 320,000
9	Geotech Fabric	SF	40000	$ 12	$ 480,000
10	Drainage at 10% Roadway	LS	1	$ 114,750	$ 114,750
11	Erosion Control and SWPPP	LS	1	$ 50,000	$ 50,000
12	Signing and Striping	LS	1	$ 50,000	$ 50,000
Sub-Total					$ 1,562,518
13	Contingency at 25%				$ 390,630
14	Engineering and Construction Admin at 25%				$ 488,287
15	Right of Way	SF			$ -
TOTAL					$ 2,441,435

Assuming 1000 feet widen (Length); 20 feet width (Both Sides)
Assuming 8" AC; 20" AB/ASB. Use same depth for shoulder for future widening.
Assume 5 feet vertical fill.

SR 12 Corridor Study
Project No. 6
Widen SR 12 at Peatland Road

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (15%)	LS	1	$ 32,465	$ 32,465
2	Traffic Control (15%)	LS	1	$ 28,230	$ 28,230
3	Clear and Grub	LS	1	$ 10,000	$ 10,000
4	Excavation	CY	300	$ 45	$ 13,500
5	Saw Cut	LF	500	$ 10	$ 5,000
6	Import Fill	CY	600	$ 35	$ 21,000
7	Aggregate Base	Ton	1200	$ 45	$ 54,000
8	Asphalt Concrete	Ton	500	$ 80	$ 40,000
9	Geotech Fabric	SY	1200	$ 10	$ 12,000
10	Drainage at 10% Roadway	LS	1	$ 12,700	$ 12,700
11	Erosion Control and SWPPP	LS	1	$ 10,000	$ 10,000
12	Signing and Striping	LS	1	$ 10,000	$ 10,000
Sub-Total					$ 248,895
13	Contingency at 30%				$ 74,668
14	Engineering and Construction Admin at 30%				$ 97,069
15	Right of Way	SF			$ -
TOTAL					$ 420,632

Assuming 500 feet widen (Length); 20 feet width (One side only)
Assuming 8" AC; 20" AB/ASB. Use same depth for shoulder for future widening.
Assume 5 feet vertical fill.

SR 12 Corridor Study
Project No. 7
Widen SR 12 at Correia Road

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (15%)	LS	1	$ 32,465	$ 32,465
2	Traffic Control (15%)	LS	1	$ 28,230	$ 28,230
3	Clear and Grub	LS	1	$ 10,000	$ 10,000
4	Excavation	CY	300	$ 45	$ 13,500
5	Saw Cut	LF	500	$ 10	$ 5,000
6	Import Fill	CY	600	$ 35	$ 21,000
7	Aggregate Base	Ton	1200	$ 45	$ 54,000
8	Asphalt Concrete	Ton	500	$ 80	$ 40,000
9	Geotech Fabric	SF	1200	$ 10	$ 12,000
10	Drainage at 10% Roadway	LS	1	$ 12,700	$ 12,700
11	Erosion Control and SWPPP	LS	1	$ 10,000	$ 10,000
12	Signing and Striping	LS	1	$ 10,000	$ 10,000
Sub-Total					$ 248,895
13	Contingency at 30%				$ 74,668
14	Engineering and Construction Admin at 30%				$ 97,069
15	Right of Way	SF			$ -
TOTAL					$ 420,632

Assuming 500 feet widen (Length); 20 feet width (One side only)
Assuming 8" AC; 20" AB/ASB. Use same depth for shoulder for future widening.
Assume 5 feet vertical fill.

SR 12 Corridor Study
Project No. 8
Widen SR 12 at Jackson Slough Road and Signalize

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (5%)	LS	1	$ 137,406	$ 137,406
2	Traffic Control (5%)	LS	1	$ 130,863	$ 130,863
3	Clear and Grub	LS	1	$ 15,000	$ 15,000
4	Excavation	CY	1200	$ 25	$ 30,000
5	Saw Cut	LF	2000	$ 5	$ 10,000
6	Import Fill	CY	7500	$ 15	$ 112,500
7	Aggregate Base	Ton	9400	$ 25	$ 235,000
8	Asphalt Concrete	Ton	4000	$ 80	$ 320,000
9	Geotech Fabric	SF	40000	$ 12	$ 480,000
10	Drainage at 10% Roadway	LS	1	$ 114,750	$ 114,750
11	Erosion Control and SWPPP	LS	1	$ 50,000	$ 50,000
12	Signal and Lighting	LS	1	$ 250,000	$ 250,000
13	Signing and Striping	LS	1	$ 1,000,000	$ 1,000,000
Sub-Total					$ 2,885,518
14	Contingency at 25%				$ 721,380
15	Engineering and Construction Admin at 25%				$ 901,724
16	Right of Way	SF	0		$ -
TOTAL					$ 4,508,622

Assuming 1000 feet widen (Length); 20 feet width (Both Sides)
Assuming 8" AC; 20" AB/ASB. Use same depth for shoulder for future widening.
Assume 5 feet vertical fill.

SR 12 Corridor Study
Project No. 9
Realign Tower Park Way and Glasscock Road

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (5%)	LS	1	$ 512,980	$ 512,980
2	Traffic Control (5%)	LS	1	$ 488,553	$ 488,553
3	Clear and Grub	LS	1	$ 50,000	$ 50,000
4	Excavation	CY	3900	$ 25	$ 97,500
5	Saw Cut	LF	2000	$ 5	$ 10,000
6	Import Fill	CY	15000	$ 15	$ 225,000
7	Aggregate Base	Ton	76600	$ 25	$ 1,915,000
8	Asphalt Concrete	Ton	61600	$ 80	$ 4,928,000
9	Geotech Fabric	SF	40000	$ 12	$ 480,000
10	Drainage at 10% Roadway	LS	1	$ 765,550	$ 765,550
11	Erosion Control and SWPPP	LS	1	$ 50,000	$ 50,000
12	Signal and Lighting	LS	1	$ 250,000	$ 250,000
13	Signing and Striping	LS	1	$ 1,000,000	$ 1,000,000
Sub-Total					$ 10,772,583
14	Contingency at 25%				$ 2,693,146
15	Engineering and Construction Admin at 25%				$ 3,366,432
16	Right of Way	SF	10000	$ 5	$ 50,000
TOTAL					$ 16,882,160

Assuming 20' widening. 1000 feet on each side

SR 12 Corridor Study
Project No. 10
Widen SR 12 at Terminus Road

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (10%)	LS	1	$ 22,396	$ 22,396
2	Traffic Control (10%)	LS	1	$ 20,360	$ 20,360
3	Clear and Grub	LS	1	$ 10,000	$ 10,000
4	Excavation	CY	300	$ 45	$ 13,500
5	Saw Cut	LF	500	$ 10	$ 5,000
6	Import Fill	CY	1000	$ 35	$ 35,000
7	Aggregate Base	Ton	1200	$ 45	$ 54,000
8	Asphalt Concrete	Ton	500	$ 80	$ 40,000
9	Reinforcing Fabric	SY	1200	$ 10	$ 12,000
10	Drainage at 10% Roadway	LS	1	$ 14,100	$ 14,100
11	Erosion Control and SWPPP	LS	1	$ 10,000	$ 10,000
12	Signing and Striping	LS	1	$ 10,000	$ 10,000
Sub-Total					$ 246,356
13	Contingency at 30%				$ 73,907
14	Engineering and Construction Admin at 30%				$ 96,079
15	Right of Way	SF	0		$ -
TOTAL					$ 416,342

Assuming 500 feet widen (Length); 20 feet width (One side only)
Assuming 8" AC; 20" AB/ASB. Use same depth for shoulder for future widening.
Assume 5 feet vertical fill.

SR 12 Corridor Study
Project No. 11
Widen SR 160 at SR 12

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (10%)	LS	1	$ 35,996	$ 35,996
2	Traffic Control (10%)	LS	1	$ 32,724	$ 32,724
3	Clear and Grub	LS	1	$ 15,000	$ 15,000
4	Excavation	CY	1800	$ 25	$ 45,000
5	Saw Cut	LF	1200	$ 5	$ 6,000
6	Aggregate Base	Ton	2800	$ 25	$ 70,000
7	Asphalt Concrete	Ton	1200	$ 80	$ 96,000
8	Geotech Fabric	SF	2700	$ 12	$ 32,400
9	Drainage at 10% Roadway	LS	1	$ 19,840	$ 19,840
10	Erosion Control and SWPPP	LS	1	$ 3,000	$ 3,000
11	Signal Modification	LS	1	$ 10,000	$ 10,000
12	Signing and Striping	LS	1	$ 30,000	$ 30,000
Sub-Total					$ 395,960
13	Contingency at 30%				$ 118,788
14	Engineering and Construction Admin at 30%				$ 154,425
15	Right of Way	SF	6000	$ 5	$ 30,000
TOTAL					$ 699,173

Assuming 200 feet widening and 100 feet transition on SR 160
Assuming 8" AC; 20" AB/ASB.

SR 12 Corridor Study
Project No. 12
Add Passing Lanes between Westgate Road and East of Flag City Boulevard

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (5%)	LS	1	$ 391,519	$ 391,519
2	Traffic Control (5%)	LS	1	$ 372,875	$ 372,875
3	Clear and Grub	LS	1	$ 50,000	$ 50,000
4	Excavation	CY	8900	$ 25	$ 222,500
5	Saw Cut	LF	20000	$ 5	$ 100,000
6	Import Fill	CY	30000	$ 15	$ 450,000
7	Aggregate Base	Ton	24000	$ 25	$ 600,000
8	Asphalt Concrete	Ton	20000	$ 80	$ 1,600,000
10	Drainage at 10% Roadway	LS	1	$ 265,000	$ 265,000
11	Upgrade Culvert Crossing	EA	1	$ 20,000	$ 20,000
12	Erosion Control and SWPPP	LS	1	$ 50,000	$ 50,000
13	Undercrossing or Overcrossing	EA	2	$ 1,500,000	$ 3,000,000
14	Upgrade Railroad Crossing	LS	1	$ 1,000,000	$ 1,000,000
15	Signing and Striping	LS	1	$ 100,000	$ 100,000
Sub-Total					$ 8,221,894
16	Contingency at 25%				$ 2,055,473
17	Engineering and Construction Admin at 25%				$ 2,569,342
18	Right of Way	SF	100000	$ 5	$ 500,000
TOTAL					$ 13,346,709

Assuming 18,300 feet widen (Length); 20 feet width (Both Sides)
Assuming 8" AC; 20" AB/ASB. Use same depth for shoulder for future widening.
Assume 5 feet vertical fill.

SR 12 Corridor Study
Project No. 13
Add Passing Lanes between I-5 and Potato Slough Bridge

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (10%)	LS	1	$ 1,564,145	$ 1,564,145
2	Traffic Control (10%)	LS	1	$ 1,421,950	$ 1,421,950
3	Clear and Grub	LS	1	$ 100,000	$ 100,000
4	Excavation	CY	5100	$ 25	$ 127,500
5	Saw Cut	LF	23000	$ 2	$ 46,000
6	Import Fill	CY	42600	$ 15	$ 639,000
7	Aggregate Base (Light Weight)	Ton	46000	$ 40	$ 1,840,000
8	Asphalt Concrete	Ton	23000	$ 80	$ 1,840,000
9	Rubberized Asphalt Concrete	Ton	29900	$ 80	$ 2,392,000
10	Grind Existing AC	SY	72000	$ 10	$ 720,000
11	Drainage Wick	SY	52000	$ 50	$ 2,600,000
12	Geofabric Permeable	SY	52000	$ 15	$ 780,000
13	Reinforcing Fabric	SY	124000	$ 10	$ 1,240,000
14	Reconstruction Drainage Ditch	LS	23000	$ 15	$ 345,000
15	Upgrade Culvert Crossing	EA	10	$ 20,000	$ 200,000
16	Erosion Control and SWPPP	LS	1	$ 250,000	$ 250,000
17	Environmental Mitigation	LS	1	$ 1,000,000	$ 1,000,000
18	Signing and Striping	LS	1	$ 100,000	$ 100,000
Sub-Total					$ 17,205,595
19	Contingency at 25%				$ 4,301,399
20	Engineering and Construction Admin at 25%				$ 5,376,748
21	Right of Way	SF	115000	$ 2	$ 230,000
TOTAL					$ 27,113,742

Assume 23000 feet length and 20 feet width.
Assume 8" AC and 20" AB.
Assume 5 feet vertical fill.
Assume right of way takes on one side (5 feet)

SR 12 Corridor Study
Project No. 14
Add Passing Lanes between Potato Slough Bridge and Mokelumne River Bridge

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (10%)	LS	1	$ 1,549,295	$ 1,549,295
2	Traffic Control (10%)	LS	1	$ 1,408,450	$ 1,408,450
3	Clear and Grub	LS	1	$ 100,000	$ 100,000
4	Excavation	CY	4900	$ 25	$ 122,500
5	Saw Cut	LF	22000	$ 2	$ 44,000
6	Import Fill	CY	86000	$ 15	$ 1,290,000
7	Aggregate Base (Light Weight)	Ton	44000	$ 40	$ 1,760,000
8	Asphalt Concrete	Ton	22000	$ 80	$ 1,760,000
9	Rubberized Asphalt Concrete	Ton	28600	$ 80	$ 2,288,000
10	Grind Existing AC	SY	68000	$ 10	$ 680,000
11	Drainage Wick	SY	44000	$ 50	$ 2,200,000
12	Geofabric - Permeable	SY	52000	$ 15	$ 780,000
13	Reinforcing Fabric	SY	118000	$ 10	$ 1,180,000
14	Reconstruction Drainage Ditch	LF	22000	$ 15	$ 330,000
15	Upgrade Culvert Crossing	EA	10	$ 20,000	$ 200,000
16	Erosion Control and SWPPP	LS	1	$ 250,000	$ 250,000
17	Environmental Mitigation	LS	1	$ 1,000,000	$ 1,000,000
18	Signing and Striping	LS	1	$ 100,000	$ 100,000
Sub-Total					$ 17,042,245
19	Contingency at 25%				$ 4,260,561
20	Engineering and Construction Admin at 25%				$ 5,325,702
21	Right of Way	SF	110000	$ 2	$ 220,000
TOTAL					$ 26,848,508

Assume 22000 feet length and 20 feet width.
Assume 8" AC and 20" AB.
Assume 7 feet vertical fill.
Assume right of way takes on one side (5 feet)
Requires settlement period. Double mobilization & traffic.

SR 12 Corridor Study
Project No. 15
Add Passing Lanes between Mokelumne River Bridge and SR 160

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (10%)	LS	1	$ 1,910,755	$ 1,910,755
2	Traffic Control (10%)	LS	1	$ 1,737,050	$ 1,737,050
3	Clear and Grub	LS	1	$ 100,000	$ 100,000
4	Excavation	CY	6200	$ 25	$ 155,000
5	Saw Cut	LF	28000	$ 2	$ 56,000
6	Import Fill	CY	41500	$ 15	$ 622,500
7	Aggregate Base (Light Weight)	Ton	56000	$ 40	$ 2,240,000
8	Asphalt Concrete	Ton	28000	$ 80	$ 2,240,000
9	Rubberized AC Overlay	Ton	36400	$ 80	$ 2,912,000
10	Grind Existing AC	SY	75000	$ 10	$ 750,000
11	Drainage Wick	SY	62000	$ 50	$ 3,100,000
12	Geofabric Permeable	SY	62000	$ 15	$ 930,000
13	Reinforcing Fabric	SY	137000	$ 10	$ 1,370,000
14	Reconstruction Drainage Ditch	LS	23000	$ 15	$ 345,000
15	Upgrade Culvert Crossing	EA	10	$ 20,000	$ 200,000
16	Erosion Control and SWPPP	LS	1	$ 250,000	$ 250,000
17	Environmental Mitigation	LS	1	$ 2,000,000	$ 2,000,000
18	Signing and Striping	LS	1	$ 100,000	$ 100,000
Sub-Total					$ 21,018,305
19	Contingency at 25%				$ 5,254,576
20	Engineering and Construction Admin at 25%				$ 6,568,220
21	Right of Way	SF	140000	$ 2	$ 280,000
TOTAL					$ 33,121,102

Assume 28000 feet length and 20 feet width.
Assume 8" AC and 20" AB.
Assume 4 feet vertical fill.
Assume right of way takes on one side
Requires settlement period. Double mobilization & traffic.

SR 12 Corridor Study
Project No. 16
Widen SR 12 to 6 Lanes between Lower Sacramento Road and Cherokee Lane

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (5%)	LS	1	$ 1,465,721	$ 1,465,721
2	Traffic Control (5%)	LS	1	$ 1,395,925	$ 1,395,925
3	Clear and Grub	LS	1	$ 25,000	$ 25,000
4	Remove Curb and Gutter	LF	22000	$ 5	$ 110,000
5	Remove Sidewall	LF	154000	$ 5	$ 770,000
6	Excavation	CY	9800	$ 25	$ 245,000
7	Saw Cut	LF	22000	$ 2	$ 44,000
8	Aggregate Base	Ton	13900	$ 35	$ 486,500
9	Asphalt Concrete	Ton	6600	$ 80	$ 528,000
10	Curb and Gutter	LF	22000	$ 15	$ 330,000
11	Sidewalk	SF	154000	$ 10	$ 1,540,000
12	Drainage Inlet	EA	22	$ 2,500	$ 55,000
13	Manhole	EA	22	$ 1,000,000	$ 22,000,000
14	RCP	LF	2200	$ 100	$ 220,000
15	Relocate Street Lights	EA	110	$ 1,500	$ 165,000
16	Modify Signal	EA	7	$ 50,000	$ 350,000
17	Retaining Wall	SF	8000	$ 100	$ 800,000
18	Modify Bridge Abutment	EA	2	$ 25,000	$ 50,000
19	Modify Landscaping	LS	1	$ 100,000	$ 100,000
20	Signing and Striping	LS	1	$ 100,000	$ 100,000
Sub-Total					$ 30,780,146
21	Contingency at 25%				$ 7,695,037
22	Engineering and Construction Admin at 25%				$ 9,618,796
23	Right of Way	SF	132000	$ 20	$ 2,640,000
TOTAL					$ 50,733,979

Assume 22000 feet on each side
Assume 6 feet widening on each side
Assume utilities will be relocated by others

SR 12 Corridor Study
Project No. 18
Widen SR 12 to 4 Lanes from Lower Sacramento Road to Flag City Boulevard

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (5%)	LS	1	$ 306,789	$ 306,789
2	Traffic Control (5%)	LS	1	$ 292,180	$ 292,180
3	Clear and Grub	LS	1	$ 50,000	$ 50,000
4	Excavation	CY	8900	$ 25	$ 222,500
5	Saw Cut	LF	18300	$ 5	$ 91,500
6	Import Fill	CY	20000	$ 15	$ 300,000
7	Aggregate Base	Ton	32600	$ 25	$ 815,000
8	Asphalt Concrete	Ton	27400	$ 80	$ 2,192,000
9	Median Barrier	LF	18300	$ 35	$ 640,500
10	Drainage at 10% Roadway	LS	1	$ 362,100	$ 362,100
11	Upgrade Culvert Crossing	EA	1	$ 20,000	$ 20,000
12	Erosion Control and SWPPP	LS	1	$ 50,000	$ 50,000
13	Upgrade Railroad Crossing	LS	1	$ 1,000,000	$ 1,000,000
14	Signing and Striping	LS	1	$ 100,000	$ 100,000
Sub-Total					$ 6,442,569
15	Contingency at 25%				$ 1,610,642
16	Engineering and Construction Admin at 25%				$ 2,013,303
17	Right of Way	SF	91500	$ 5	$ 457,500
TOTAL					$ 10,524,014

Assuming 18,300 feet widen (Length); 20 feet width (Both Sides)
Assuming 8" AC; 20" AB/ASB. Use same depth for shoulder for future widening.
Assume 3 feet vertical fill.

SR 12 Corridor Study
Project No. 19
Mokelumne River Bridge Replacement

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (5%)	LS	1	$ 1,011,413	$ 1,011,413
2	Traffic Control (5%)	LS	1	$ 963,250	$ 963,250
3	Clear and Grub	LS	1	$ 50,000	$ 50,000
4	Concrete Barrier	LF	3000	$ 75	$ 225,000
5	New Bridge	SF	90200	$ 100	$ 9,020,000
6	Swing Bridge	SF	22800	$ 400	$ 9,120,000
7	Reconstruction Approach	EA	2	$ 100,000	$ 200,000
8	Remove Existing Bridge	LS	1	$ 500,000	$ 500,000
9	Erosion Control and SWPPP	LS	1	$ 100,000	$ 100,000
10	Signing and Striping	LS	1	$ 50,000	$ 50,000
Sub-Total					$ 21,239,663
11	Contingency at 25%				$ 5,309,916
12	Engineering and Construction Admin at 25%				$ 6,637,395
TOTAL					$ 33,186,973

Assume a new bridge - 82 feet wide
Assume a new swing bridge

SR 12 Corridor Study
Project No. 20
Potato Slough Bridge Widening

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (5%)	LS	1	$ 768,390	$ 768,390
2	Traffic Control (5%)	LS	1	$ 731,800	$ 731,800
3	Clear and Grub	LS	1	$ 50,000	$ 50,000
4	Remove Concrete Barrier	LF	3460	$ 50	$ 173,000
5	Concrete Barrier	LF	3200	$ 75	$ 240,000
6	Bridge Widening	SF	100800	$ 100	$ 10,080,000
7	Swing Widening	SF	9920	$ 400	$ 3,968,000
8	Erosion Control and SWPPP	LS	1	$ 100,000	$ 100,000
9	Signing and Striping	LS	1	$ 25,000	$ 25,000
Sub-Total					$ 16,136,190
10	Contingency at 25%				$ 4,034,048
11	Engineering and Construction Admin at 25%				$ 5,042,559
TOTAL					$ 25,212,797

Assuming 32 feet widening with a median barrier.
Assume swing section can be widened

SR 12 Corridor Study
Project No. 21
Widen SR 12 to 4 Lanes from I-5 to Rio Vista Bridge

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (5%)	LS	1	$ 2,974,545	$ 2,974,545
2	Traffic Control (5%)	LS	1	$ 2,832,900	$ 2,832,900
3	Clear and Grub	LS	1	$ 200,000	$ 200,000
4	Excavation	CY	16200	$ 25	$ 405,000
5	Saw Cut	LF	73000	$ 2	$ 146,000
6	Import Fill	CY	135000	$ 15	$ 2,025,000
7	Aggregate Base (Light Weight)	Ton	234000	$ 40	$ 9,360,000
8	Asphalt Concrete	Ton	117000	$ 80	$ 9,360,000
9	Rubberized AC Overlay	Ton	36400	$ 80	$ 2,912,000
11	Drainage Wick	SY	260000	$ 50	$ 13,000,000
12	Geofabric Permeable	SY	260000	$ 15	$ 3,900,000
14	Reconstruction Drainage Ditch	LS	23000	$ 15	$ 345,000
15	Upgrade Culvert Crossing	EA	10	$ 1,000,000	$ 10,000,000
16	Erosion Control and SWPPP	LS	1	$ 250,000	$ 250,000
17	Environmental Mitigation	LS	1	$ 2,000,000	$ 2,000,000
9	Median Barrier	LF	73000	$ 35	$ 2,555,000
14	Signing and Striping	LS	1	$ 200,000	$ 200,000
Sub-Total					$ 62,465,445
15	Contingency at 25%				$ 15,616,361
16	Engineering and Construction Admin at 20%				$ 15,616,361
17	Right of Way	SF	730000	$ 2	$ 1,460,000
TOTAL					$ 95,158,168

Assuming 73,000 feet widen (Length); 24 feet, plus 8 feet shoulder and median barrier with 4 feet left shoulder
Assuming 8" AC; 20" AB/ASB.
Assume 5 feet vertical fill.

SR 12 Corridor Study
Project No. 21 (Alternate)
Viaduct from Potato Slough to West of Rio Vista Bridge

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (1%)	LS	1	$ 3,709,225	$ 3,709,225
2	Traffic Control (1%)	LS	1	$ 3,672,500	$ 3,672,500
3	Clear and Grub	LS	1	$ 1,000,000	$ 1,000,000
4	Viaduct	MILES	11	$ 33,000,000	$ 363,000,000
5	Environmental Mitigation	LS	1	$ 2,000,000	$ 2,000,000
6	Erosion Control and SWPPP	LS	1	$ 1,000,000	$ 1,000,000
7	Signing and Striping	LS	1	$ 250,000	$ 250,000
Sub-Total					$ 374,631,725
8	Contingency at 25%				$ 93,657,931
9	Engineering and Construction Admin at 20%				$ 93,657,931
10	Right of Way	SF	5,000,000	$ 2.00	$ 10,000,000
TOTAL					$ 571,947,588

1000000

Assume 76 feet viaduct bridge
Replaces Mokelumne and Potato Slough Bridges

SR 12 Corridor Study
Project No. 21
Widen SR 12 to 4 Lanes from I-5 to Potato Slough Bridge

Item	Description	Unit	Quantity	Unit Price	Total
1	Mobilization (8%)	LS	1	$ 1,511,222	$ 1,511,222
2	Traffic Control (8%)	LS	1	$ 1,399,280	$ 1,399,280
3	Clear and Grub	LS	1	$ 100,000	$ 100,000
4	Excavation	CY	6200	$ 25	$ 155,000
5	Saw Cut	LF	28000	$ 2	$ 56,000
6	Import Fill	CY	52000	$ 15	$ 780,000
7	Aggregate Base (Light Weight)	Ton	90000	$ 40	$ 3,600,000
8	Asphalt Concrete	Ton	45000	$ 80	$ 3,600,000
11	Drainage Wick	SY	100000	$ 50	$ 5,000,000
12	Geofabric Permeable	SY	100000	$ 15	$ 1,500,000
14	Reconstruction Drainage Ditch	LS	28000	$ 15	$ 420,000
15	Upgrade Culvert Crossing	EA	5	$ 20,000	$ 100,000
16	Erosion Control and SWPPP	LS	1	$ 100,000	$ 100,000
17	Environmental Mitigation	LS	1	$ 1,000,000	$ 1,000,000
9	Median Barrier	LF	28000	$ 35	$ 980,000
14	Signing and Striping	LS	1	$ 100,000	$ 100,000
Sub-Total					$ 20,401,502
15	Contingency at 25%				$ 5,100,376
16	Engineering and Construction Admin at 20%				$ 5,100,376
17	Right of Way	SF	280000	$ 2	$ 560,000
TOTAL					$ 31,162,254

Assuming 28000 feet widen (Length); 32 feet widening with median barrier $ 603,109,841
Assuming 8" AC; 20" AB/ASB.
Assume 5 feet vertical fill.